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ABSTRACT

This monograph is a computer printout which presents a final report from an analysis of data on cooperation among 29 regional groupings in over 16,000 dyadic relationships (interactions between two nations). Regional groupings included geographic areas such as Africa and Latin America and international organizations such as the North Atlantic Treaty Organization (NATO), the Organization of American States (OAS), and the Warsaw Pact. Analysis was based on application of distance theory to World Event Interaction Survey (WEIS) conflict data. Distance theory is an analytical approach to the study of international relations which implies that systems can be compared to each other with regard to scores on specific variables and that scores can be measured according to their distance above or below the scores for another system. The major objective of this report was to indicate how cooperation varies across regional groupings and to evaluate the significance that such variation might have. The method involved applying distance theory to various regional groupings and to evaluate the significance that such variation might have. The method involved applying distance theory to various regional groupings and dyadic relationships, generating a model for each nation in the system, and comparing each model to a world model. Variables included level of economic development, power base, mean economic development of nations within a regional group, number and type of cooperative interactions, and regional differences. Findings indicated that economic development is related to cooperation expectation (more developed nations tend to cooperate more often and in more ways), cooperative interactions among nations within a regional grouping tend to exceed chance expectations, the relevance of distance theory for each state varies, and a general world model can be developed from models of individual nations. (DB)

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ATTRIBUTES AND NATIONAL BEHAVIOR, PART 2: MODERN INTERNATIONAL RELATIONS MONOGRAPH SERIES.
DISTANCE THEORY, RESULTS FOR COOPERATION, 1966-69.

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TAPE SPECS ARE: 9 TRACK, 800 BPI, EBCDIC, 132 CHARACTER RECORDS, 2400 FEET.

NOTE! SINCE THE CODEBOOK WAS PUBLISHED, MONOGRAPHS 1-6, 10, 27 AND 39 HAVE BEEN FURTHER EDITED, REDUNDANCY REMOVED AND GATHERED TOGETHER UNDER THE TITLE OF: PROJECT THEORY: INTERPRETATIONS AND POLICY RELEVANCE. THIS COLECTION MAY BE FOUND IN FILE 8. SINCE IT IS UPDATED, IT IS RECOMENDED THAT THIS FILE BE USED INSTEAD-OF THE ORIGINAL MATERIALS IN THE APPROPRIATE CASES. IN THE CASE OF THE OTHER FILES, THEY RETAIN THE ORIGINAL BUILT-IN REDUNDANCY.

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NOTE: ALL MONOGRAPHS ON TAPE ARE SET UP TO PRINT ON A UNIVAC DOCUMENT PROCESSOR. SPECIAL PROGRAMS TO ASSIST IN PRINTING ON A DECWRITER II FOR UPPER AND LOWER CASE, DOUBLE SPACE, LENGTH ADJUSTED FOR THE DECWRITER AND WITH FOOTNOTE CAPABILITY, ARE CONTAINED IN MONOGRAPH 26. TABLES OR FIGURES THAT GO BEYOND 80 COLUMNS MAY BE FOLDED IF THE DOCUMENT PROCESSOR IS USED. IF THIS IS UNDESIRABLE, THEY CAN BE PRINTED BY OTHER STANDARD PRINT COMMANDS, SUCH AS AN EDITOR PROGRAM, WHICH CAN PRINT, WITHOUT FOLDING, TO 132 COLUMNS. ALSO, DOCUMENT COMMANDS ARE INVISIBLE IN THE COPY ONLY IF THE DOCUMENT PROCESSOR IS USED. IF OTHER PRINT COMMANDS ARE USED, THE DOCUMENT COMMANDS WILL BE VISIBLE, I.E., WILL APPEAR AS >DOUBLE>, >SPACE>, ETC. AND ARE LEFT JUSTIFIED. IF THEY ARE NOT NEEDED, THEY CAN BE IGNORED OR EDITED OUT. ALL MONOGRAPHS ARE IN MIXED UPPER AND LOWER CASE, EXCEPT MONOGRAPHS 19 AND 26, WHICH ARE IN UPPER CASE ONLY.

Attributes and National Behavior:

Modern International Relations Monograph Series

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DISTANCE THEORY, RESULTS FOR COOPERATION, 1966-69XX001

INTRODUCTION.

THE PURPOSE OF THIS PAPER IS TO REPORT ON THE TESTING OF DISTANCE THEORY ON WEIS COOPERATION DATA FOR THE YEARS 1966-69.
DISTANCE THEORY BELONGS TO A FAMLIY OF THEORIES. EACH ATTEMPTS TO EXPLAIN STATE BEHAVIOR IN TERMS OF ATTRIBUTES OR ATTRIBUTE DISTANCES. XX002 DISTANCE THEORY CAN BE UNDERSTOOD BEST BY DISCUSSING ITS MOST DIRECT PREDECESSORS, ATTRIBUTE AND SOCIAL FIELD THEORIES. BOTH WILL BE TREATED BRIEFLY.

ATTRIBUTE THEORY.
ATTRIBUTE THEORY CONCEPTUALIZES TWO COLLECTIONS OF VARIABLES, A-SPACE VARIABLES RELATING TO ATTRIBUTES, AND B-SPACE VARIABLES RELATING TO BEHAVIOR. IT STATES THAT A-SPACE VARIABLES, EXPRESSED AS FACTOR SCORES, XX003 SHOULD CORRELATE HIGHLY WITH B-SPACE VARIABLES.
IN FORMAL TERMS, ATTRIBUTE THEORY HAS BOTH A FORMULA AND >AXIOMS>.

1.ATTRIBUTE THEORY, FORMULA XX004
A=BW WHERE A=NATION BY BEHAVIOR VECTOR, B=NATION BY FACTOR SCORE MATRIX OF A-SPACE AND W=A LEAST SQUARES SOLUTION OF VECTOR PARAMETER WEIGHTS.

THE AXIOMS OF ATTRIBUTE THEORY:

1. INTERNATIONAL RELATIONS IS A FIELD CONSISTING OF ALL OF THE ATTRIBUTES AND INTERACTIONS OF NATIONS AND THEIR COMPLEX INTERRELATIONSHIPS. 2. THE INTERNATIONAL FIELD CAN BE ANALYTICALLY DIVIDED INTO ATTRIBUTE, A, BEHAVIOR, B, SPACES IN WHICH ATTRIBUTES AND INTERACTIONS ARE PROJECTED, RESPECTIVELY, AS VECTORS. 3. THE ATTRIBUTE AND BEHAVIORAL SPACES ARE GENERATED BY A FINITE SET OF LINEARLY INDEPENDENT DIMENSIONS. 4. NATIONS ARE LOCATED AS VECTORS IN ATTRIBUTE AND BEHAVIOR SPACE. 5. THE VECTORS IN A-SPACE ARE FORCES DETERMINING THE LOCATION OF NATIONS IN B-SPACE. 6. B-SPACE IS A SUBSPACE OF A-SPACE. XX005

ATTRIBUTE THEORY, IN APPLICATION, CAN BE CONVIENTLY SUMMARIZED THROUGH THE FOLLOWING FIGURE:

PUT FIGURE 1 ABOUT HERE.

THE TERM, MONADIC, REFERS TO THE SUBJECTS OF STUDY, I.E., INDIVIDUAL NATIONS. THUS, WHEN INDIVIDUAL NATIONS, SUCH AS THE UNITED STATES, ARE SCORED ON THE FACTOR DIMENSIONS OF A FACTOR ANALYSIS OF ATTRIBUTE VARIABLES, SUCH SCORES SHOULD ACCOUNT FOR, IN CORRELATIONAL TERMS, THE SCORES GENERATED FROM AN ANALYSIS OF BEHAVIORIAL VARIABLES.

VARIOUS APPLICATIONS HAVE SHOWN THAT THESE PROCEDURES INDEED DO YIELD STRONG CORRELATIONAL FIT, AT LEAST ON SOME KINDS OF DATA. XX006

THIS FORMULATION, IN A DISGUISED FORM, CAN FREQUENTLY BE FOUND IN THE TRADITIONAL LITERATURE OF INTERNATIONAL RELATIONS. WHENEVER IT IS ARGUED THAT ONE KIND OF STATE TENDS TO DO ONE THING AND ANOTHER KIND OF STATE ANOTHER, THIS IS A VERBAL EXPRESSION OF ATTRIBUTE THEORY. THAT IS, WHEN TRADITIONAL LITERATURE EXPLAINS BEHAVIOR IN TERMS OF SUCH FACTORS AS DIFFERENCES IN ECONOMIC DEVELOPMENT, DIFFERENCES IN POLITICAL SYSTEMS, DIFFERENCES IN RELATIONSHIPS WITH THE UNITED STATES, ETC., IT IS ACTUALLY OPERATING (PERHAPS UNKNOWINGLY) WITHIN THIS FRAMEWORK. TRADITIONAL APPROACHES, HOWEVER, GENERALLY DO NOT TEST SUCH ASSERTIONS IN THE RIGOROUS WAY THAT ATTRIBUTE THEORY DEMANDS. TRADITIONAL THEORETICAL STATEMENTS ARE USUALLY OFFERED AS PROPOSITIONS THAT ARE SUPPOSED TO BE TRUE BUT ARE ACTUALLY UNTESTED IN ANY KIND OF PRECISE SENSE.

ALTHOUGH ATTRIBUTE THEORY HAS BEEN OF CONSIDERABLE VALUE, ONCE MATHEMATIZED AND CONCRETIZED, IN THE SENSE OF SPECIFYING FAIRLY EXACTLY THE RELATIONSHIPS THAT DO EXIST BETWEEN ATTRIBUTES AND BEHAVIOR, ITS VERY BREADTH TENDS TO REDUCE ITS USEFULNESS. IN APPLICATIONS OF THE THEORY, ALL STATES ARE TREATED SIMULTANEOUSLY AND THUS ANY ONE STATE TENDS TO BE LOST IN THE BROAD GENERAL PICTURE, AS WHEN GENERATING SUCH STATEMENTS AS >DEVELOPED NATIONS TEND TO BE NEGATIVE, AND UNDERDEVELOPED POSITIVE, IN THEIR ORIENTATIONS TOWARD THE UNITED NATIONS.>

THE REMAINING THEORIES, THROUGH A DYADIC APPROACH, FACILITATE GREATER UNDERSTANDING OF INDIVIDUAL NATIONS WITHIN THE INTERNATIONAL RELATIONS SYSTEM AND, THROUGH SPECIAL TECHNIQUES, SUCH AS APPLYING ATTRIBUTE THEORY TO DYADIC RESULTS, STILL ALLOW BROAD GENERALIZATIONS CONCERNING DYADIC BEHAVIOR.

THE FIRST DYADIC THEORY TO BE DISCUSSED WILL BE SOCIAL FIELD THEORY.

SOCIAL FIELD THEORY.

SOCIAL FIELD THEORY HAS AS ITS FORMULA:

2.SOCIAL FIELD THEORY, FORMULA, MODEL 2 XX007
S=TW, WHERE S=DYAD BY BEHAVIOR VECTOR, T=DYAD BY ALGEBRAIC DISTANCE MATRIX OF FACTOR SCORES OF A-SPACE AND W=A LEAST SQUARES SOLUTION OF VECTOR PARAMETER WEIGHTS.

THE AXIOMS OF SOCIAL FIELD THEORY:

1. INTERNATIONAL RELATIONS IS A FIELD CONSISTING OF ALL THE ATTRIBUTES AND INTERACTIONS OF NATIONS AND THEIR COMPLEX INTERRELATIONSHIPS. 2. THE INTERNATIONAL RELATIONS FIELD CAN BE ANALYTICALLY DIVIDED INTO ATTRIBUTE, A, AND BEHAVIOR, B, SPACES INTO WHICH ATTRIBUTES AND INTERACTIONS ARE PROJECTED, RESPECTIVELY, AS VECTORS. 3. THE ATTRIBUTE AND BEHAVIORAL SPACES ARE GENERATED BY A FINITE SET OF LINEARLY INDEPENDENT DIMENSIONS. 4. NATIONS ARE LOCATED AS VECTORS IN ATTRIBUTE SPACE AND COUPLED INTO DYADS IN BEHAVIOR SPACE. 5. THE DISTANCE VECTORS IN A-SPACE THAT CONNECT NATIONS ARE SOCIAL FORCES DETERMINING LOCATION OF DYADS IN B-SPACE. 6. THE DIRECTION AND VELOCITY OF MOVEMENT OVER TIME OF A DYAD IN B-SPACE IS ALONG THE RESOLUTION VECTOR OF THE FORCES, D. 7. B-SPACE IS A SUBSPACE OF A-SPACE (RUMMEL, 1969,A: 16).

AGAIN, A DIAGRAM MAY PROVE USEFUL.

PUT FIGURE 2 ABOUT HERE.

IT CAN BE SEEN THAT IN BROAD OUTLINES SOCIAL FIELD THEORY IS SIMILAR TO ATTRIBUTE THEORY. THE PRIMARY DIFFERENCE CONCERNS THE SUBJECTS OF STUDY, DYADS INSTEAD OF MONADS, AND THE USE OF DISTANCES INSTEAD OF FACTOR SCORES (IN A-SPACE).

THE TERM, DYAD, REFERS TO TWO NATIONS LINKED IN SOME WAY. IN B-SPACE, FOR EXAMPLE, THE PROTESTS OF THE UNITED STATES TOWARD GREAT BRITAIN WOULD BE ONE VALUE IN A DISTRIBUTION OF SCORES FOR THE VARIABLE, PROTESTS. ANOTHER VALUE MIGHT BE THE PROTESTS OF THE UNITED STATES TOWARD RUSSIA, AND SO FORTH. IN OTHER OTHER WORDS, A NUMERIC VALUE IN B-SPACE REPRESENTS THE BEHAVIOR OF ONE ACTOR TOWARD ANOTHER.

IN A-SPACE THE DYADIC VALUE REPRESENTS THE DISTANCE BETWEEN TWO MONADIC SUBJECTS IN RESPECT TO THEIR FACTOR SCORES ON SOME DIMENSION, SUCH AS ECONOMIC DEVELOPMENT. FOR EXAMPLE, THE DISTANCE BETWEEN THE UNITED STATES AND RUSSIA MIGHT BE +1.0. THIS WOULD INDICATE THAT THE UNITED STATES IS MORE DEVELOPED THAN RUSSIA BY ONE UNIT. THAT IS, IF THE U.S. DEVELOPMENT SCORE WERE +3.0 AND RUSSIA'S DEVELOPMENT SCORE WERE +2.0, THE DIFFERENCE BETWEEN THEM, 3.0 - 2.0, WOULD EQUAL 1.0. ON THE OTHER HAND, IF A STATE WERE MORE DEVELOPED THAN THE UNITED STATES, SAY, WITH A SCORE OF 4.0, THE VALUE WOULD BECOME 3.0 - 4.0 = -1.0, INDICATING

THAT THE UNITED STATES WAS ONE UNIT OF DEVELOPMENT BELOW THE STATE IN QUESTION.

AFTER THE DYADIC DISTANCES ARE COMPUTED IN A-SPACE, ON THE DIMENSIONS OF A-SPACE, THEY ARE CORRELATED WITH B-SPACE, USING DYADS AS SUBJECTS.

THE TERM, DYADIC SET, IS USED TO DESCRIBE A COLLECTION OF DYADIC VALUES IN EITHER SPACE. FOR EXAMPLE, ALL OF THE U.S. DISTANCES TO OTHER STATES CONSTITUTES THE U.S. DYADIC SET IN A-SPACE, WHILE ALL OF THE U.S. DYADIC SCORES IN B-SPACE CONSTITUTE THE U.S. DYADIC SET OF THAT SPACE. IT SHOULD BE BE OBVIOUS THAT THERE ARE AS MANY DYADIC SETS IN EACH SPACE AS THERE ARE NATIONS TREATED IN THE ANALYSIS, I.E., A U.S.S.R. DYADIC SET, A FRENCH DYADIC SET, A CHINESE DYADIC SET, ETC.

IF ALL DYADIC SETS ARE TREATED SIMULTANEOUSLY IN THE CORRELATIONAL ANALYSES, SUCH AN APPLICATION IS REFERRED TO AS SOCIAL FIELD THEORY, MODEL 1. SINCE THE PARAMETER WEIGHTS GENERATED THROUGH SUCH AN ANALYSIS (THAT IS, THE WEIGHTS PLACED ON THE PREDICTOR VARIABLES OF A-SPACE IN AN ANALYSIS USING MULTIPLE REGRESSION XX008 OR CANONICAL CORRELATION XX009 ARE A LINEAR FUNCTION OF THE WEIGHTS GENERATED IN THE SAME SPACE IN ATTRIBUTE THEORY, USING THE SAME DATA AND METHODS, MODEL 1 IS SELDOM EMPLOYED.

MODEL 2 TREATS EACH DYADIC SET TAKEN FROM EACH SPACE SEPARATELY. FOR EXAMPLE, THERE IS A U.S. DYADIC SET ANALYSIS, A U.S.S.R. DYADIC SET ANALYSIS, A CHINESE DYADIC SET ANALYSIS, ETC. THROUGH SUCH PROCEDURES, PARAMETER WEIGHTS ARE ALLOWED TO VARY FROM SET TO SET, IN CONTRAST TO MODEL 1, WHERE PARAMETER WEIGHTS ARE GENERATED ACROSS ALL DYADIC SETS.

SOCIAL FIELD THEORY, AS ELABORATED BY RUMMEL, DOES NOT GO BEYOND THIS POINT. WITH THE APPLICTION OF THESE PROCEDURES, THEN, EACH NATION WILL HAVE ITS OWN UNIQUE PREDICTIVE EQUATION. VINCENT (1973,A), HOWEVER, HAS ARGUED THAT SIGN MODELS SHOULD BE EMPLOYED TO GENERATE PREDICTIVE EQUATIONS CUTTING ACROSS DYADIC SETS. XX010
THIS WILL BE MORE FULLY DEVELOPED IN THE TREATMENT OF DISTANCE THEORY

TO SUMMARIZE, SOCIAL FIELD THEORY ARGUES THAT DYADIC ALGEBRAIC DISTANCES, COMPUTED FROM THE FACTOR SCORES OF A-SPACE, SHOULD EXPLAIN IN CORRELATIONAL TERMS THE BEHAVIOR SCORES OF B-SPACE.

DISTANCE THEORY.

3.DISTANCE THEORY, FORMULA(VINCENT, 1976)

C=DW WHERE C=DYAD BY BEHAVIOR VECTOR, D=DYAD BY FACTOR SCORES MATRIX OF D-SPACE AND W=A LEAST SQUARES SOLUTION OF VECTOR PARAMETER WEIGHTS.

BASIC ASSUMPTIONS OF DISTANCE THEORY, MODEL 2 XX011

1. THE INTERNATIONAL RELATIONS SYSTEM CAN BE DESCRIBED FOR PREDICTIVE PURPOSES AS A COLLECTION OF VARIABLES. 2. THE COLLECTION OF VARIABLES CAN BE DIVIDED INTO TWO INFINITE SUBSETS: ONE, A-SPACE, RELATES TO THE ATTRIBUTES OF NATIONS, AND THE OTHER, B-SPACE, RELATES TO THE DYADIC BEHAVIOR (I TO J). 3. THE DISTANCE OF ONE NATION TO ANOTHER ON EACH OF THE VARIABLES OF A-SPACE CAN BE ASCERTAINED BY COMPUTING THE ABSOLUTE DIFFERENCE OF THEIR Z-SCORES /(I-J)/ TO CREATE D-SPACE. 4. AN APPROXIMATE BASIS OF DISTANCE SPACE (D-SPACE) AND B-SPACE CAN BE COMPUTED BY FACTOR ANALYZING, SEPARATELY, A LARGE SAMPLE OF VARIABLES IN EACH SPACE. 5. COLLECTIVELY, THE FACTOR SCORES OF D-SPACE CAN ACCOUNT FOR A SIGNIFICANT PORTION OF THE VARIANCE OF THE DYADIC FACTOR SCORES OF B-SPACE. (VINCENT, 1976).

DISTANCE THEORY PRESENTS AN ALTERNATIVE APPROACH TO THE PROBLEM OF ASSESSING HOW ATTRIBUTE DISTANCES EXPLAINS BEHAVIOR. AS INDICATED ABOVE, SOCIAL FIELD THEORY WORKS WITH AN ALGEBRAIC METRIC. EXAMINATION OF FIGURE 3, BELOW, SHOWS THAT A J NO DISTANCE FROM I, USING RUMMEL'S ALGEBRIC METRIC, IS PREDICTED, UNDER THE CONDITION OF POSITIVE PERFECT FIT, TO HAVE AVERAGE COOPERATION WITH I WHILE THE J MOST DEVIANT, ABOVE I, IS PREDICTED TO HAVE THE LEAST COOPERATION WITH I AND THE J MOST DEVIANT BELOW I, THE MOST COOPERATION (THAT IS, WHEN +'S GO WITH +'S AND -'S GO WITH -'S).

PUT FIGURE 3 ABOUT HERE.

IF DISTANCE IS A FORCE FOR CONFLICT AND/OR COOPERATION, THIS MAY NOT BE WELL CAPTURED USING SUCH A MEASURE. NATIONS NO DIFFERENT FROM I WILL BE PREDICTED (ASSUMING POSTIVE FIT) TO HAVE AVERAGE COOPERATION, AS LONG AS SOME ACTORS ARE ABOVE I AND OTHER ACTORS ARE BELOW I. THE QUESTION CAN BE ASKED, >WHY SHOULD AN ACTOR NO DIFFERENT FROM ANOTHER BE PREDICTED TO HAVE AVERAGE COOPERATION IF DISTANCE IS SUPPOSED TO BE A CAUSE OF CONFLICT AND/OR COOPERATION?>

AN ABSOLUTE MEASURE OF DISTANCE PROVIDES A SCALE THAT ALLOWS DISTANCE TO CONTRIBUTE EITHER ONE WAY OR THE OTHER TO CONFLICT OR COOPERATION. USING THE FORMULA /I-J/ TO COMPUTE THE DISTANCES, WE GET, IN CONTRAST TO FIGURE 3:

PUT FIGURE 4 ABOUT HERE.

IN TERMS OF THE ABOVE FIGURE, IT CAN BE SEEN, IF THE PARAMETER

WEIGHT IS POSITIVE, WE EXPECT LITTLE COOPERATION FOR J'S LIKE I, AND MUCH COOPERATION FOR J'S DISTANT FROM I, WHILE, IF THE SIGN IS NEGATIVE, WE EXPECT MUCH COOPERATION FOR J'S CLOSE TO I AND LITTLE COOPERATION FOR J'S DISTANT FROM I. IN OTHER WORDS, THE ROLE OF DISTANCE (AS A GENERAL NON-DIRECTIONAL CONCEPT) IS CAPTURED BY THIS MEASURE. POSITIVE CORRELATIONS WITH THE COOPERATION SCALE INDICATE >THE MORE DISTANCE THE MORE COOPERATION,> WHILE NEGATIVE CORRELATIONS INDICATE >THE LESS DISTANCE THE MORE COOPERATION.> THE REVERSAL OF COOPERATION EXPECTATIONS, DEPENDING ON WHETHER J IS ABOVE OR BELOW I, IS ELIMINATED WITH THIS MEASURE AND THE POSSIBLY COUNTER-INTUITIVE NOTION THAT NO DISTANCE SHOULD PREDICT AVERAGE CONFLICT AND/OR COOPERATION IS ELIMINATED. WITH THE ABSOLUTE MEASURE, A J NO DISTANCE FROM I WILL BE PREDICTED TO HAVE EITHER THE MOST OR THE LEAST CONFLICT OR COOPERATION, BUT NEVER AVERAGE CONFLICT OR COOPERATION.

FIGURE 5 DEPICTS THE BASIC MODEL OF DISTANCE THEORY.

PUT FIGURE 5 ABOUT HERE.

IT CAN BE SEEN THAT THE DYADIC FACTOR SCORES OF D-SPACE ARE DIFFERENT FROM THE DISTANCES OF SOCIAL FIELD THEORY. SOCIAL FIELD THEORY COMPUTES ALGEBRAIC DISTANCES ON A-SPACE FACTOR DIMENSIONS WHILE DISTANCE THEORY CREATES FACTOR DIMENSIONS OUT OF ABSOLUTE DISTANCES, COMPUTED FROM ORIGINAL VARIABLES. THE PREDICTORS OF SOCIAL FIELD THEORY ARE ALGEBRAIC DISTANCES, WHILE THE PREDICTORS OF DISTANCE THEORY ARE DYADIC FACTOR SCORES, INDICATING LOCATION IN D-SPACE.

TO ILLUSTRATE, ASSUME THAT PER CAPITA GNP AND RADIOS PER 1000 POPULATION LOADED POSITIVELY AND HEAVILY ON A DIMENSION CALLED ECONOMIC DEVELOPMENT DISTANCE. THIS WOULD INDICATE THAT DYADS WITH HIGH FACTOR SCORES TEND TO HAVE LARGE ABSOLUTE DISTANCES ON THESE VARIABLES AND DYADS WITH SMALL FACTOR SCORES, LITTLE ABSOLUTE DISTANCE ON THESE VARIABLES. IF THE PARAMETER WEIGHT ON ECONOMIC DEVELOPMENT DISTANCE WAS POSITIVE IN EXPLAINING SOME COOPERATION DIMENSION, SAY, REWARDS, THIS WOULD INDICATE THAT THE MORE ECONOMIC DEVELOPMENT DISTANCE BETWEEN DYADIC PARTNERS, THE MORE LIKELY I EXPORTS REWARDS TO J, AND, THE LESS DISTANCE BETWEEN DYADIC PARTNERS IN RESPECT TO THEIR ECONOMIC DEVELOPMENT DISTANCE, THE LESS LIKELY I EXPORTS REWARDS TO J. A SIMILAR INTERPRETATION WOULD PERTAIN TO ALL OF THE D- AND B-SPACE VARIABLES.

AFTER ALL OF THE DYADIC SETS HAVE BEEN TREATED, A SIGN MODEL CAN BE COMPUTED ACROSS ALL THE DYADIC SETS TO DETERMINE THE DIRECTION, + OR -, OF THE PARAMETER SIGNS ON EACH OF THE FACTORS OF D-SPACE. THIS IS DONE BY SQUARING EACH PARAMETER WEIGHT AND SUMMING ACROSS DYAIC SETS, BUT RETAINING THE ORIGINAL (PRIOR TO SQUARING) SIGN. SINCE THE SQUARE OF THE WEIGHTS EQUAL VARIACE EXPLAINED BETWEEN THE PREDICTOR VARIBLES IN QUESTION AND THE PREDICTED VALUES, GENERATED BY THE LEAST SQUARES SOLUTION, A GENERAL SIGN MODEL CAN BE GENERATED THROUGH SUCH AN APPLICATION. IF THERE IS A DRIFT IN

ONE DIRECTION OR ANOTHER (+ OR -), THIS WILL BE REVEALED. IF SOME CLASSIFICATION IS EMPLOYED, SUCH AS EUROPE, EXACTLY THE SAME PROCEDURES ARE UTILIZED, BUT ONLY ON THE DYADIC SETS INCLUDED WITHIN THAT CLASSIFICATION.

HOPEFULLY, THIS KIND OF APPROACH WILL EVENTUALLY SUGGEST CRUCIAL OR PIVOTAL VARIABLES THAT MIGHT ASSIST IN EXPLAINING COOPERATION IN THE INTERNATIONAL RELATION SYSTEM.

STILL ANOTHER WAY TO APPROACH DISTANCE THEORY IS TO THINK IN TERMS OF >EXPECTATIONS> WHEN EITHER + OR SIGNS ARE OBSERVED, ON FACTOR DIMENSIONS IN EMPIRICAL APPLICATIONS. THESE MAY BE SUMMARIZED AS:

PUT FIGURE 6 ABOUT HERE.

THIS FIGURE WILL PROVE USEFUL IN INTERPRETING THE WEIGHTS GENERATED FROM VARIOUS CANONICAL CORRELATION ANALYSES THAT FOLLOW.

IN TECHNICAL TERMS, THEN, THE PURPOSE OF THE PAPER ARE TO: 1. PRESENT THE WEIGHTS AND SIGNS FOR EACH STATE (128 IN ALL) GENERATED BY APPLYING DISTANCE THEORY TO WEIS COOPERATION DATA, 2. EVALUATE THE WEIGHTS AND SIGNS IN TERMS OF ATTRIBUTE THEORY (EXPLAINED BELOW), AND 3. CONSTRUCT A GENERAL MODEL, FROM THE CANONICAL ANALYSIS, FOR THE STATE SYSTEM AS A WHOLE.

TO MAKE THE ANALYSIS MEANINGFUL IT IS FIRST NECESSARY TO 1. PRESENT THE MAJOR FEATURES OF THE A AND D-SPACE ANALYSES AND 2. DISCUSS THE WEIS COOPERATION DATA MANIPULATIONS.

CONSTRUCTING A-SPACE.

THE VARIABLES OF A-SPACE WERE TAKEN, FOR THE MOST PART, FROM THE CROSS-POLITY TIME SERIES (BANKS, 1971) AND THE WORLD HANDBOOK OF POLITICAL SOCIAL INDICATORS (TAYLOR AND HUDSON, 1971). THE EXACT VARIABLE LIST WILL SHORTLY. VARIABLES WERE SELECTED ON THE FOLLOWING GROUNDS: FIRST, THEY HAD TO CLEARLY PERTAIN TO THE ATTRIBUTES OF STATES. SECOND, THE INFORMATION (TOTAL COLLECTION USED) WAS REQUIRED TO BE 90% COMPLETE. WHERE INFORMATION WAS MISSING, OR AMBIGUOUS, REGRESSION ESTIMATES WERE USED. THE REGRESSION ESTIMATE ROUTINE EMPLOYED SEARCHES THE ENTIRE COLLECTION OF VARIABLES TO FIND THAT VARIABLE ON WHICH THE SUBJECT HAS INFORMATION MOST CLOSELY RELATED TO THE VARIABLE ON WHICH THE INFORMATION IS MISSING. SIMPLE REGRESSION IS THEN USED TO ESTIMATE THE MISSING VALUE. SINCE MANY VARIABLES HAD SKEWED DISTRIBUTIONS, A RANK TRANSFORMATION XX012 WAS ALSO EMPLOYED. THUS, NUMBER

SEQUENCES, SUCH AS 1 3 7, WERE CHANGED TO SEQUENCES SUCH AS 1 2 3. THIS TRANSFORMATION GIVES BASIC AGREEMENT BETWEEN THE MEAN AND MEDIAN OF A DISTRIBUTION, SO THAT THERE ARE AS MANY CASES ABOVE THE MEAN AS BELOW IT.

RESULTS.

THE FOLLOWING PRESENTS AN ANALYSIS OF THE ROTATED LOADINGS OF A-SPACE. THAT IS, A-SPACE WAS GENERATED BY FACTOR ANALYZING 144 ATTRIBUTE VARIABLES, WHICH RESULTED IN 22 FACTORS. THE 22 FACTOR LOADINGS ARE LISTED WITH THE VARIABLE NAMES. FOR EXAMPLE, TOTAL POPULATION LOADS -.23 ON THE FIRST FACTOR. THE LAST ENTRY OR THE 23RD INDICATES THE COMMUNALITY. IN THE CASE OF TOTAL POPULATION THE COMMUNALITY IS .95. THIS MEANS THAT 90% OF THE VARIANCE OF TOTAL POPULATION IS ACCOUNTED FOR BY THE 22 FACTORS. THE ENTRY, COLUMN SUMS OF SQUARES, GIVES THE AMOUNT OF VARIANCE EXPLAINED BY EACH FACTOR IN AGGREGATE VARIANCE TERMS. FOR EXAMPLE, THE FIRST FACTOR ACCOUNTS FOR 31.17 UNITS OF VARIANCE OUT OF THE 144 POSSIBLE UNITS OF VARIANCE. ALL COLUMN SUMS OF SQUARES EXCEED 1.0. BECAUSE A 1.0 EIGENVALUE CUT-OFF WAS EMPLOYED. XX013

FOLLOWING THE COLUMN SUMS OF SQUARES ANALYSIS, EACH FACTOR IS NAMED AND VARIABLE LOADINGS .49 OR LARGER ON EACH FACTOR ARE GROUPED AND PRESENTED IN ORDER OF DECENDING MAGNITUDE. FOR EXAMPLE, NATIONAL GOVERNMENT REVENUE PER CAPITA IS THE LARGEST POSITIVE LOADING ON THE FACTOR OF ECONOMIC DEVELOPMENT. THIS MEANS THAT .92 SQUARED OR 85 PERCENT OF THE VARIANCE OF NATIONAL GOVERNMENT REVENUE PER CAPITA IS ACCOUNTED FOR BY THE FACTOR OF ECONOMIC DEVELOPMENT. A NATION WITH A HIGH FACTOR SCORE ON THIS FACTOR, THEN, WOULD TEND TO HAVE HIGH SCORES ON ALL OF THE POSITIVELY LOADING VARIABLES AND LOW SCORES ON THE NEGATIVELY LOADING VARIABLES. A SIMILAR INTERPRETATION PERTAINS FOR THE REMAINING FACTORS. FOR EXAMPLE, STATES SCORING HIGH ON POWER BASE TEND TO HAVE HIGH SCORES IN RESPECT TO TOTAL PRIMARY SCHOOL ENROLLMENT, TOTAL SCHOOL ENROLLMENT, TOTAL POPULATION ETC. IN CASE OF A FACTOR, SUCH AS FACTOR 4, NON-COMPETITIVE POLITICAL SYSTEM, WHICH HAS ALL NEGATIVE LOADINGS, INTERPRETATION SHOULD BE EQUALLY AS CLEAR. IN THIS CASE, A STATE WITH A HIGH FACTOR SCORE TENDS TO HAVE LOW SCORES IN RESPECT TO AGGREGATE COMPETITION INDEX, PARTY LEGITIMACY, COMPETITIVENESS OF NOMINATING PROCESS, LEGISLATIVE EFFECTIVENESS, ETC.

PUT TABLE 1 ABOUT HERE.

THE ABOVE, THEN, COMPLETES THE CONSTRUCTION OF A-SPACE. THE FACTOR SCORES OF THIS SPACE WILL AID IN THE INTERPRETATION OF THE D-SPACE ANALYSES THAT FOLLOW.

CONSTRUCTING D-SPACE.

IT IS NECESSARY, OF COURSE, TO CONSTRUCT D-SPACE TO TEST DISTANCE THEORY. THE D-SPACE ROTATED LOADINGS ARE PRESENTED IN THE FOLLOWING TABLE. TO ILLUSTRATE, THE LOADINGS OF TOTAL POPULATION ON THE 33 FACTORS ARE GIVEN FIRST. THE 34TH ENTRY, .76, IS THE COMMUNALITY FOR TOTAL POPULATION. THE EXPLANATORY POWER OF THE FACTORS IS GIVEN BY THE COLUMN SUMS OF SQUARES FIGURES. IT CAN BE SEEN THAT THE FIRST FACTOR EXPLAINS 18.76 UNITS OF VARIANCE OUT OF THE POSSIBLE 144 UNITS OF VARIANCE THAT COULD HAVE BEEN EXPLAINED. SINCE KAISER'S (1958) RULE OF 1.0 CUT OFF WAS UTILIZED, ALL COLUMN SUMS THE SQUARES EXCEED 1.0

TO SIMPLIFY FACTOR INTERPRETATION, AGAIN, LOADINGS .49 OR GREATER ARE GROUPED AND SORTED IN TERMS OF MAGNITUDE FOR EACH FACTOR. IN THE CASE OF THE FIRST FACTOR, POWER BASE DISTANCE, TOTAL GROSS NATIONAL PRODUCT IN MILLIONS OF U.S. DOLLARS LOADS .91, TOTAL EDUCATIONAL EXPENDITURES IN MILLION OF U.S. DOLLARS LOADS .88 AND SO FORTH. NAMES, SUCH AS POWER BASED DISTANCE, OF COURSE, AS IN THE CASE OF A-SPACE, ARE ARBITRARILY ASSIGNED.

PUT TABLE 2 ABOUT HERE.

CONSIDERING THE FIRST DIMENSION, KNOWING THAT ABSOLUTE DISTANCES WERE COMPUTED ON THESE VARIABLES AND THAT ALL THE VARIABLES POSITIVELY CORRELATE WITH THE FACTOR, WE CAN MAKE THE FOLLOWING INTERPRETATION. DYADS THAT ARE CLOSE (SMALL /I-J/) IN RESPECT TO THEIR POWER BASE DISTANCE ARE GROUPED AT THE BOTTOM OF THE DIMENSION AND DYADS THAT ARE DISSIMILAR IN RESPECT TO THEIR POWER BASE DISTANCE ARE GROUPED AT THE TOP OF THE DIMENSION. THE VARIABLE LIST INDICATES WHAT THE PRIMARY DISCRIMINATORS ARE, IN RESPECT TO THESE FACTOR SCORE ASSIGNMENTS. DISTANCES, IN RESPECT TO POWER BASE, THEN, ARE HIGHLY PATTERNED. IF WE KNOW A DYAD'S FACTOR SCORE ON THIS DIMENSION, WE CAN PREDICT, WITH VARYING DEGREES OF CONFIDENCE, DISTANCE IN RESPECT TO 28 DIFFERENT VARIABLES. TO PUT IT ANOTHER WAY, IF A DYAD HAS A HIGH FACTOR SCORE ON THIS DIMENSION, IT TENDS TO BE DISTANCE IN RESPECT TO TOTAL GROSS NATIONAL PRODUCT, TOTAL EDUCATIONAL EXPENDITURES, TOTAL ENERGY CONSUMPTION, ETC. CONVERSELY, IF A DYAD HAS A SMALL FACTOR SCORE ON THIS DIMENSION, THE PARTNERS TEND TO BE CLOSE IN RESPECT TO TOTAL GROSS NATIONAL PRODUCT, TOTAL EDUCATIONAL EXPENDITURES, TOTAL ENERGY CONSUMPTION, ETC. KNOWLEDGE OF A DYAD'S FACTOR SCORE, THEN, IMMEDIATELY GIVES US INFORMATTION ON LIKELY LOCATION ON A HOST OF VARIABLES.

CONSIDERING THE SECOND DIMENSION, IT CAN BE SEEN THAT ALMOST ALL

OF THESE VARIABLES ARE PER CAPITAL ECONOMIC IN NATURE. AGAIN, THE INTERPRETATION IS RELATIVELY SIMPLE, SINCE THERE ARE NO NEGATIVE LOADINGS. ALL DYADS WITH LARGE FACTOR SCORES TEND TO BE DISTANT IN RESPECT TO THESE VARIABLES WHILE DYADS WITH SMALL FACTOR SCORES TEND TO BE SIMILAR.

CONSIDERING THE THIRD DIMENSION, SINCE THESE ARE POLITICAL VARIABLES AND THE LOADINGS ARE POSITIVE, DYADS WITH LARGE FACTOR SCORES TEND TO BE DISSIMILAR IN RESPECT TO THESE VARIABLES, AND THOSE WITH SMALL FACTOR SCORES SIMILAR.

IT SHOULD BE APPARENT BY NOW THAT TO GO THROUGH ALL 33 DIMENSIONS IN THIS FASHION IS UNNECESSARY.

PROBABLY ALL THAT NEEDS TO BE CLARIFIED NOW IS HOW TO MAKE AN INTERPRETATION WHEN NEGATIVE LOADINGS OCCUR, SUCH AS IN THE CASE OF THE SIXTH DIMENSION. THE REASON THE TERM, CLOSENESS, INSTEAD OF DISTANCE IS USED IS BECAUSE OF THE NEGATIVE SIGNS ARE GIVEN TO THE HEAVIEST LOADING VARIABLES. SINCE THESE LOADINGS ARE CORRELATIONS WITH THE FACTOR SCORES, IT SHOULD BE APPARENT THAT THOSE WITH LARGE FACTOR SCORES WILL TEND TO BE CLOSE (NOT HAVE LARGE DISTANCES) ON THE VARIABLES THAT ARE GROUPED, WHILE THOSE WITH SMALL FACTOR SCORES WILL TEND TO BE DISTANT ON THESE VARIABLES. THUS, WE MAY GENERALIZE, WHEN LOADINGS ARE POSITIVE WE KNOW THAT LARGE FACTOR SCORES INDICATE DISTANCE ON THE GROUPED VARIABLES, WHILE, IF THE LOADINGS ARE NEGATIVE, SUCH SCORES INDICATE CLOSENESS. WHEN LOADINGS ARE POSITIVE, SMALL FACTOR SCORES INDICATE CLOSENESS BUT WHEN LOADINGS ARE NEGATIVE, SMALL FACTOR SCORES INDICATE DISTANCE. WITH THIS SIMPLE RULE THE IMPLICATIONS OF THE FACTOR SCORES AND LOADINGS SHOULD BE CLEAR.

THE NEXT STEP REQUIRED TO TEST DISTANCE THEORY IS TO SCORE EACH DYAD IN RESPECT TO IT'S CONFLICT AND COOPERATION.

WEIS DATA MANUPULATIONS.

THE WEIS COLLECTION IS HIGHLY SUITED FOR THE LAST STATED REQUIREMENT. IN THE COLLECTION NUMEROUS MEASURES OF CONFLICT AND COOPERATION ARE SCORED FOR VIRTUALLY EVERY STATE OVER A CONSIDERABLE TIME PERIOD.MCCLELLAND, 1972) ONE PROBLEM IN BUILDING GENERALIZATIONS FROM THIS COLLECTION, HOWEVER, IS THE DEGREE OF SPECIFICITY WHEN ONE FOCUSES UPON ANY PARTICULAR MEASURE. THE MAJORITY OF STATES TEND TO HAVE 0 SCORES REGARDLESS OF WHAT CATEGORY IS PICKED IN THE COLLECTION. SUCH SCORES, IF USED IN CORRELATIONAL ANALYSES, THEN, ARE HIGHLY NON-NORMAL AND MOST ENTRIES ARE 0. IN APPARENT RECOGNITION OF THIS PROBLEM, THE WEIS SCHOLARS HAVE ATTEMPTED TO DEVELOP SOMEWHAT MORE GENERAL CATEGORIES BY GROUPING HIGHLY SIMILAR ACTS AND, FOR OUR PURPOSES, 12 CLASSIFICATIONS OF CONFLICT AND 8 CLASSIFICATIONS OF COOPERATION HAVE BEEN CHOSEN. THESE ARE:

PUT TABLE 3 ABOUT HERE.

CONFLICT AND COOPERATION EXPORTATIONS ARE STILL RELATIVELY INFREQUENT EVENTS, IN THE SENSE THAT A DYADIC MATRIX, 16, 256 (128 TIMES 127 = 16,256) BY THE NUMBER OF COOPERATION OR CONFLICT VARIABLES CONSIDERED, HAS AN EXTREMELY LARGE PROPORTION OF ZERO ENTRIES. A THREE-YEAR PERIOD WAS EMPLOYED TO FURTHER REDUCE THE NUMBER OF SUCH ENTRIES. TO CREATE A STILL FURTHER REDUCTION, ALL OF THE CONFLICT VARIABLES (12 IN NUMBER) WERE REDUCED TO A SINGLE VECTOR AND LIKEWISE FOR THE COOPERATION VARIABLES (8 IN NUMBER). THAT IS, TO APPLY CORRELATION TECHNIQUES TO THE ORIGINAL COOPERATION VARIABLES, BECAUSE OF THE EXTREMELY SKEWED CHARACTER OF THE DISTRIBUTIONS, COULD UNDERCUT THE VALIDITY OF THE ANALYSIS. IN ORDER TO COMBINE THE VARIABLES INTO A SINGLE INDEX, 30 JUDGES, STUDENTS AND PROFESSORS WERE EMPLOYED TO RATE EACH OF THE VARIABLES IN TERMS OF INTENSITY ON A 5-POINT SCALE. THE INTENSITY, MEASURED BY THE JUDGE MEAN RESPONSES (GIVEN IN TABLE 3) WERE THEN USED AS WEIGHTS TO SUM THE VARIABLES. XX014

OBVIOUSLY, IT IS NOT POSSIBLE TO LIST ALL 16,000+ DYADIC SCORES. BUT, A FEELING OF THE DATA MAY BE OBTAINED BY LISTING A SUMMARY INDEX OF THE TOTAL COOPERATION FOR EACH STATE, OBTAINED BY SUMMING ALL NUMBERS IN EACH PART OF THE VECTOR FOR EACH STATE.

PUT TABLE 4 ABOUT HERE.

THE STAGE IS NOW SET FOR APPLYING AND INTERPRETING DISTANCE THEORY RESULTS ON THE DATA. 128 CORRELATION RUNS WERE MADE USING THE D-SPACE FACTOR SCORES (MATRIX:16,256 X 33) AND THE WEIS DYADIC VECTOR (VECTOR:16,256 X 1).

FINDINGS: CANONICAL CORRELATIONS XX015

THE FOLLOWING ANALYSIS PRESENTS THE CANONICAL CORRELATION RESULTS. EACH COUNTRY IS LISTED WITH ITS CANONICAL CORRELATION IN TERMS OF DESENDING MAGNITUDE. FOR EXAMPLE, NIGERIA HAS THE HIGHEST CANONICAL CORELATION, .72. STATES WITH ZERO CANONICAL CORELATIONS WERE COUNTRIES WHICH EXPORTED NO COOPERATION AND HENCE COULD NOT BE ANALYZED IN THE APPLICATION. THEY MAY HAVE RECEIVED COOPERATION, HOWEVER, AND WERE INCLUDED IN ALL ANALYSES WERE THAT WAS THE CASE.

PUT TABLE 5 ABOUT HERE.

OBVIOUSLY, DISTANCE THEORY DOES NOT APPLY EQUALLY TO ALL STATES. WE MAY, HOWEVER, USE ATTRIBUTE THEORY TO ATTEMPT TO DISCERN ANY PATTERNS IN THESE WEIGHTS THAT IS, WE CAN CORRELATE THE FACTOR SCORES OF A-SPACE WITH THE CANONICAL CORRELATION RESULTS. WHEN THIS IS DONE WE OBTAIN: POWER BASE (.65), SMALL CHRISTIAN COMMUNITY (.27), RECENT NATIONAL INDEPENDENCE (-.22), LITTLE DOMESTIC VIOLENCE (-.36), FEW MILITARY PERSONNEL PER CAPITA (-.21), MANY ELECTIONS (.21) AND LOW CRUDE DEATH RATE (.23), R=.61, P=.0004. THUS, THE HIGHER THE POWER BASE, DOMESTIC VIOLENCE, ELECTIONS, AND MILITARY PERSONNEL OF A STATE BUT THE LOWER ITS CHRISTIAN COMMUNITY, DEATH RATE AND THE LATER ITS NATIONAL INDEPENDENCE, THE HIGHER ITS CANONICAL CORRELATION (USING DISTANCE THEORY) TENDS TO BE. TO PUT IT ANOTHER WAY, DISTANCE THEORY HAS THE MOST RELEVANCE FOR STATES WITH SUCH CHARACTERISTICS BUT LESS RELEVANCE FOR STATES WITH THE OPPOSITE CHARACTERISTICS. IN THIS CONNECTION, A CRUCIAL QUESTION CONCERNS WHETHER OR NOT THE THEORY IS SIGNIFICANT EN TOTO. WHENEVER MANY CORRELATIONS ARE COMPUTED AN AVERAGE EXPECTED CORRELATION CAN BE COMPUTED IN TERMS OF N, THE NUMBER OF SUBJECTS, AND V, THE NUMBER OF VARIABLES. WE MAY THEN COMPARE THEORTICAL EXPECTATIONS WITH ACTUAL RESULTS AND DRAW A CONCLUSION.

THE FOLLOWING CHART COMPARES THE THEORY ON THIS AND OTHER IMPORTANT MATTERS.

NUMBER OF CORRELATIONS REFERS TO THE NUMBER OF DYADIC SUB-SETS THAT WERE ANALYZED.

N OF CORRELATIONS REFERS TO THE ACTUAL NUMBER OF DYADS ANALYZED.

RANGE OF CORRELATIONS REFERS TO THE CANONICAL CORRELATION MAGNITUDES, MAXIMUM AND MINIMUN, FOR THE NUMBER OF CORRELATIONS ATTEMPTED.

EXPECTED CORRELATIONS REFER TO THE EXPECTED AVERAGE CORRELATIONS WHEN A LARGE NUMBER OF CORRELATIONS ARE RUN USING DIFFERENT V'S AND N'S. THIS IS BASED ON THE FORMULA V-I/N-I = SQUARE OF THE EXPECTED CORRELATION.

NUMBER ABOVE EXPECTED CORRELATION INDICATES THE ACTUAL NUMBER OF CORRELATIONS WHICH EXCEEDED THE EXPECTED VALUE.

PERCENT ABOVE EXPECTED CORRELATION IS FOUND BY DIVIDING ROW ENTRY 5 BY ROW ENTRY 1.

EXPECTED AVERAGE SQUARE REFERS TO THE EXPECTED CORRELATION SQUARED, AS COMPUTED FROM THE ABOVE FORMULA.

ACTUAL AVERAGE SQUARE REFERS TO THE ACTUAL RESULTS IN AVERAGE CORRELATION SQUARED TERMS.

AVERAGE SQUARE ABOVE EXPECTED SQUARE REFERS TO THE DEGREE TO WHICH THE AVERAGE EXPECTED SQUARE WAS EXCEEDED.

TOTAL DYADS CONSIDERED REFERS TO ALL OF THE DYADS ACROSS ALL OF THE ANALYSES.

COLUMN SUMS OF SQUARES OF CANONICAL CORRELATIONS REFERS TO THE AGGREGATE FIGURE OBTAINED WHEN THE CANONICAL CORRELATIONS ARE SQUARED AND THEN SUMMED. THE FIGURE OBTAINED IS THE AGGREGATE VARIANCE EXPLAINED.

PERCENT OF TOTAL VARIANCE OF THEORETICAL MAXIMUM REFERS TO THE COLUMN SUMS OF SQUARES OF THE CANONICAL CORRELATIONS DIVIDED BY THE NUMBER OF CORRELATIONS. SINCE THE MAXIMUM CORRELATION IS 1.0 AND THE SQUARE OF 1.0 IS EQUAL TO 1.0, THE THEORETICAL MAXIMUM, IN VARIANCE EXPLAINED TERMS, IS EQUAL TO THE NUMBER OF CORRELATIONS.

PUT TABLE 6 ABOUT HERE.

IT MAY BE CONCLUDED FROM THIS CHART, THAT, DISTANCE THEORY, EN TOTO, EXCEEDS CHANCE EXPECTATIONS. ALSO, THE MAGNITUDES OF THE CORRELATIONS ARE RELATED TO CERTAIN STATE CHARACTERISTICS, AS DESCRIBED ABOVE.

FINDINGS: CANONICAL WEIGHTS

THE FOLLOWING PRESENTS THE RESULTS FOR THE CANONICAL CORRELATION WEIGHTS FOR DISTANCE THEORY, COOPERATION. ALTHOUGH REFERRED TO AS WEIGHTS, IN FACT, THESE ENTRIES ARE CORRELATIONS OF THE VARIABLES IN QUESTION WITH THE CANONICAL VARIATE SCORES GENERATED IN THE CANONICAL ANALYSIS.THE TERM WEIGHTS IS USED TO AVOID CONFUSION WITH THE OUTPUT OF CANONICAL CORRELATIONS THEMSELVES. FOR EXAMPLE, IN THE CASE OF AFGHANISTAN THE ENTRY OF .31, IN THE FIRST COLUMN, INDICATES THAT POWER BASE DISTANCE IS CORRELATED .31 WITH THE CANONICAL VARIATE SCORES GENERATED IN THE ANALYSIS. IN THIS CASE, WE PREDICT THAT THOSE DYADS THAT STAND HIGH ON POWER BASE DISTANCE ALSO STAND HIGH ON THE CANONICAL VARIATE SCORES. IF THE CORRELATION IS NEGATIVE, AS IN THE CASE OF THE SIXTH COLUMN, INTERNAL VIOLENCE CLOSENESS, WE PREDICT THAT THOSE DYADS STANDING HIGH ON INTERNAL VIOLENCE CLOSENESS TEND TO STAND LOW ON THE CANONICAL VARIATE SCORES. ALL THIRTY-THREE ENTRIES CAN BE INTERPRETED IN THIS WAY.

THE LAST ENTRY, THE THIRTY-FOURTH, WHICH IS .95 IN THE CASE OF AFGHANISTAN, INDICATES THE AGGREGATE VARIANCE FOR ALL THIRTY-THREE FACTORS. IN THIS WAY, STATES CAN BE COMPARED ACROSS ANALYSES. IF THE NUMBER IS LARGE, THE CORRELATIONS TEND TO BE LARGE WHILE, OF COURSE, IF THE NUMBER IS SMALL THEY TEND TO BE SMALL. IN CASES LIKE DAHOMEY, WHERE NOTHING BUT ZEROS HAVE BEEN ENTERED, NO ANALYSIS WAS PERFORMED BECAUSE DAHOMEY DID NOT EXPORT COOPERATION, IN THE TIME PERIOD CONSIDERED, EVEN THOUGH IT MAY HAVE RECEIVED COOPERATION FROM OTHER STATES AND, THUS, IS LISTED.

THE ENTRIES UNDER COLUMN SUMS OF SQUARES INDICATE THE IMPORTANCE OF THE FACTORS IN AGGREGATE VARIANCE TERMS. FOR EXAMPLE, IN SUCH TERMS, POWER BASE DISTANCE TENDED TO BE ALMOST TWICE AS IMPORTANT AS ECONOMIC DEVELOPMENT DISTANCE, 9.83 VS 5.09.

SELECTED WEIGHTS WERE THEN SORTED IN TERMS OF DESCENDING

MAGNITUDE FOR THREE FACTORS. IN THE CASE OF THE FIRST FACTOR, POWER BASE DISTANCE, ALL STATES WITH POSITIVE WEIGHTS, THAT IS, FROM LIBYA DOWN THROUGH BURMA TENDED TO EXPORT COOPERATION TO COUNTRIES THAT ARE DISTANT FROM THEM IN RESPECT TO POWER BASE DISTANCE. COUNTRIES WITH NEGATIVE WEIGHTS, THAT IS, FROM MEXICO THROUGH THE UNITED STATES TENDED TO EXPORT COOPERATION TO STATES THAT ARE CLOSE TO THEM IN RESPECT TO POWER BASE DISTANCE. THE SAME KIND OF INTERPRETATION PERTAINS TO THE ECONOMIC DEVELOPMENT DISTANCE AND POLITICAL DISTANCE FACTORS.

PUT TABLE 7 ABOUT HERE.

THE FOLLOWING PRESENTS THE HIGHEST AND LOWEST SCORES FOR POWER BASE DISTANCE, ECONOMIC DEVELOPMENT DISTANCE, AND POLITICAL DISTANCE.

PUT TABLE 8 ABOUT HERE.

AGAIN THE QUESTION ARISES, ARE THESE PATTERNS DESCRIBABLE IN TERMS OF ATTRIBUTE THEORY? SPACE DOES NOT PERMIT ANALYZING ALL THE DIMENSIONS IN THESE TERMS BUT AN ANALYSIS CAN BE PRESENTED FOR THE THREE SELECTED FACTORS.

THE FOLLOWING PRESENTS THE RESULTS OF CORRELATING A-SPACE FACTOR SCORES WITH + OR - WEIGHTS GENERATED FROM CANONICAL CORRELATIONS USED IN TESTING THE THEORY. FOR EXAMPLE, IF THE POSITIVE WEIGHTS OF THE FACTOR OF POWER ARE UNDER CONSIDERATION, AND, ECONOMIC DEVELOPMENT CORRELATES .50 WITH THE POWER WEIGHTS, WE CAN CONCLUDE THAT, IN RESPECT TO THOSE THAT HAVE POSITIVE WEIGHTS ON POWER, THE HIGHER THE ECONOMIC DEVELOPMENT OF THE NATION THE MORE LIKELY IT WILL HAVE A LARGE WEIGHT. THE PURPOSE OF SUCH AN ANALYSIS IS TO SEE WHETHER THE MAGNITUDES OF THE WEIGHTS GENERATED FROM DISTANCE THEORY ARE EXPLAINABLE IN TERMS OF ATTRIBUTE THEORY.

PUT TABLE 9 ABOUT HERE.

USING THE FACTOR NUMBERS, GIVEN BELOW, 1=ECONOMIC DEVELOPMENT ETC., THE RESULTS MAY BE SUMMARIZED AS FOLLOWS:

PUT FIGURE 7 ABOUT HERE.

THUS, LIKE THE CANONICAL CORRELATIONS THEMSELVES, THE WEIGHTS GENERATED ON THE FACTOR DIMENSIONS OF D-SPACE APPEAR PREDICTABLE IN TERMS OF ATTRIBUTE THEORY.

ANOTHER APPROACH IS TO EXAMINE THE INFORMATION IN TERMS OF AN F-TEST OF MEAN DIFFERENCES.

THE SIGNIFICANT F-TEST RESULTS, .05 LEVEL OR LESS, MEANS OF NEGATIVE V. POSTIVE WEIGHT SUBJECTS ARE GIVEN IN TABLE 10. CONSIDERING THE FIRST CASE, POWER BASE DISTANCE, THE FACTORS SELECTED WERE ECONOMIC DEVELOPMENT (1) AND POWER BASE (2). THE F-RATIO FOR ECONOMIC DEVELOPMENT WAS 11.6664 AND THE PROBABILITY .0012. THE GROUP MEANS ON THIS FACTOR WERE .3449 (- WEIGHT SUBJECTS) AND -.2569 (+ WEIGHT SUBJECTS).

PUT TABLE 10 ABOUT HERE.

AGAIN, WE MAY SUMMARIZE THE KEY FINDINGS THROUGH A FIGURE:

PUT FIGURE 8 ABOUT HERE.

THIS FURTHER SUBSTANTIATES THE ABOVE FINDING THAT THE CANONICAL PATTERNS ARE PREDICTABLE IN TERMS OF ATTRIBUTES.

FINDINGS: GENERAL MODEL

ALTHOUGH A MODEL FOR, AND, THE RELEVANCE OF, DISTANCE THEORY FOR EACH STATE HAS BEEN GENERATED BY PRESENTATION OF THE WEIGHTS AND CANONICAL CORRELATIONS GIVEN ABOVE, A SYSTEM MODEL HAS NOT YET BEEN DISCUSSED OR PRESENTED. FOLLOWING THE METHODS DISCUSSED ABOVE, WE OBTAIN FOR THE>WORLD>:

PUT TABLE 11 ABOUT HERE.

WE CAN NOW LIST THE FACTORS AND INDICATE WHETHER DISTANCE OR CLOSENESS CONTRIBUTES TO COOPERATION CONSIDERING THE WORLD SYSTEM AS A WHOLE.

PUT TABLE 12 ABOUT HERE.

THUS, IN THE WORLD SYSTEM AS A WHOLE, I'S TEND TO EXPORT COOPERATION TO J'S THAT ARE DISTANT FROM THEM ON FACTORS SUCH AS

POWER BASE AND ECONOMIC DEVELOPMENT BUT CLOSE TO THEM ON FACTORS SUCH AS INTERNAL POLITICAL TURMOIL AND MILITARISM. IT MAY BE CONCLUDED THAT ASSERTIONS ABOUT DISTANCE OR CLOSENESS ON D-SPACE DIMENSIONS, AS PREDICTORS OF COOPERATION, FOR THE WORLD, MUST BE CAST IN FACTOR SPECIFIC TERMS.

CONCLUSIONS

FROM THE ABOVE INVESTIGATION THE FOLLOWING APPEARS ESTABLISHED: 1. STATE LOCATION ON DISTANCE CLUSTERS (FACTORS OF D-SPACE) ARE RELATED TO COOPERATION EXPORTATION (AS MEASURED BY WEIS DATA). 2. THESE RELATIONSHIPS, OVERALL, TEND TO EXCEED CHANCE EXPECTATIONS (TABLE 6). 3. THE RELEVANCE OF THE THEORY FOR EACH STATE VARIES (TABLE 5) BUT THE MAGNITUDES OF THE CORRELATIONS ARE PREDICTABLE, IN PART, FROM ATTRIBUTES (TABLE 5, DISCUSSION). 4. PARAMETER WEIGHTS FOR EACH STATE CAN BE ESTABLISHED ON THE VARIABLE CLUSTERS (TABLE 7) AND THE MAGNITUDES ARE RELATED TO ATTRIBUTES (TABLE 9, FOR SELECTED FACTORS). IN THIS CONNECTION, + WEIGHT NATIONS TEND TO BE DIFFERENT FROM - WEIGHT NATIONS (TABLE 10, FOR SELECTED FACTORS). 5. FROM THE INDIVIDUAL PARAMETER WEIGHTS, A GENERAL WORLD MODEL CAN BE DEVELOPED (TABLE 11) AND THE IMPLICATIONS OF DISTANCE AND CLOSENESS FOR COOPERATION EXPORTATIONS CAN BE ESTABLISHED (TABLE 12).

IF DISTANCE IS VIEWED AS A POSSIBLE CAUSE OF COOPERATION, POLICY PRESCRIPTIONS MIGHT ASSERT THAT TO INCREASE STATE DIFFERENCES IN RESPECT TO FACTORS WHERE DISTANCE PREDICTS COOPERATION (TABLE 12, TOP PART) AND TO REDUCE STATE DIFFERENCES IN RESPECT TO FACTORS WHERE CLOSENESS PREDICTS COOPERATION (TABLE 12, LOWER PART) WOULD BE PROPER. HOWEVER, THESE FINDINGS ARE A STARTING POINT RATHER THAN AN ENDING AS FAR AS POLICY PRESCIPTIONS ARE CONCERNED. WILL THESE RELATIONSHIPS HOLD UP IN NEW TIME PERIODS ON NEW DATA SETS? CAN THE CONCEPT OF CAUSE, AS OPPOSSED TO CORRELATION, BE CLEARLY DELINEATED IN THE SOCIAL SCIENCES SO THAT PRESCRIPTIONS CAN BE SOUNDLY BASED ON THE FORMER (ASSUMING CAUSE, ITSELF, IS A VIABLE CONCEPT)? CLEARLY, BOLDLY STATED PRESCRIPTIONS ARE NOT IN ORDER AT THIS TIME. ON THE OTHER HAND, CORRELATIONAL PATTERNS HAVE STRONGLY EMERGED IN THIS STUDY AND MAY BE RELEVANT TO COOPERATION PREDICTION IN THE I.R. SYSTEM. FOR EXAMPLE, CHANGES IN POWER BASE DIFFERENCES, ECONOMIC DEVELOPEMENT DIFFERENCES, POLITICAL DIFFERENCES, ETC., DO NOT APPEAR BEYOND THE ABILITY OF MAN TO INITIATE. IT MIGHT BE NOTED, IN CLOSING, THAT IN THE CASE OF THESE THREE >CLASSIC> CONCEPTS >POWER, ECONOMICS AND POLITICS> DIFFERENCES (RATHER THAN CLOSENESS), FOR THE WORLD SYSTEM AS A WHOLE, PREDICT COOPERATION. XX016

NOTES

(1). THE ASSISTANCE OF JIM SLITOR, WES KRANITZ AND CAROL JONES WAS GREATLY APPRECIATED.

(2). DISTANCE HAS BEEN MEASURED IN TWO WAYS IN THE THEORIES. ABSOLUTE DISTANCE IS A MEASURE OF THE DISTANCE BETWEEN TWO NATIONS ON A VARIABLE BASED ON THE FORMULA: D = /I-J/. FOR EXAMPLE, IF NATION I = +5 AND NATION J = +2, THE DISTANCE BETWEEN THEM IS +3. HOWEVER, IF I = +2 AND J = +5, THE DISTANCE BETWEEN THEM REMAINS +3. THIS MEASURE, THEN, MEASURES DISTANCE, REGARDLESS OF DIRECTION, AND ALL DISTANCE WILL HAVE A POSITIVE SIGN. THIS METRIC FINDS ITS USE IN DISTANCE THEORY.

ALGEBRAIC DISTANCE IS A MEASURE OF THE DISTANCE BETWEEN TWO NATIONS ON A VARIABLE, BASED ON THE FORMULA: D = I-J. FOR EXAMPLE, IF NATION I = +5 AND NATION J = +2, THE DISTANCE BETWEEN THEM IS +3. BUT, IF I = +2 AND J = +5, THE DISTANCE IS -3. THIS METRIC, THEN, MEASURES WHETHER I IS ABOVE OR BELOW J. IF I IS ABOVE J, THE DISTANCE VALUE WILL HAVE A + SIGN. IF I IS BELOW J, THE DISTANCE WILL HAVE A - SIGN. THIS MEASURE OF DISTANCE IS USED IN SOCIAL FIELD AND STATUS-FIELD THEORIES.

(3). FACTOR ANALYSIS REFERS TO CERTAIN MATHEMATICAL TECHNIQUES, THE PURPOSE OF WHICH IS TO REDUCE A LARGE NUMBER OF INDICES (VARIABLES) INTO A SMALLER NUMBER OF FACTORS. FACTORS MAY BE VIEWED AS INTERVENING VARIABLES WHICH EMERGE FROM THE PATTERN OF INTERCORRELATION AMONG INDICES. VARIOUS TECHNIQUES OF FACTOR

EXTRACTION HAVE BEEN EMPLOYED. IN THE PRINCIPAL AXIS METHOD, OPERATIONS ARE PERFORMED UPON A MATRIX CONSISTING OF THE INTERCORRELATIONS OF THE INDICES WITH ONE ANOTHER. THE FIRST >FACTOR> (OR >COMPONENT>) IS THAT WHICH ACCOUNTS FOR THE GREATEST PROPORTION OF THE INTERCORRELATIONS. SUCCESSIVE OPERATIONS UPON SUCCESSIVE, RESIDUAL MATRICES GENERATE THE SECOND FACTOR, THE THIRD FACTOR, ETC. EACH FACTOR IS MATHEMATICALLY DEFINED SO THAT IT IS ORTHOGONAL TO THE OTHER FACTORS. EACH INDICES >LOADS> DIFFERENTLY UPON EACH OTHER. THESE LOADINGS OR WEIGHTS MAY BE VIEWED AS CORRELATIONS OF THE INDICES WITH THE FACTORS AND MAY BE UTILIZED TO GENERATE >FACTOR SCORES> WHICH EXPRESS EACH SUBJECT'S POSITION ON EACH FACTOR. FACTORS ARE SOMETIMES ROTATED TO MAXIMIZE THE LOADINGS FOR CERTAIN INDICATORS AND MINIMIZE THE LOADINGS FOR OTHERS. ROTATED FACTOR LOADINGS PRESENT THE SIMPLEST POSSIBLE PICTURE OF THE CONTRIBUTIONS OF THE INDICES TO THE FACTORS. ONCE FACTOR SCORES HAVE BEEN CALCULATED, IT IS POSSIBLE TO CORRELATE THEM WITH OTHER INDICES TO FACILITATE PREDICTION AND DESCRIPTION. FACTOR ANALYSIS HAS PROVEN TO BE A POWERFUL TOOL OF ANALYSIS IN SEVERAL INTERNATIONAL RELATIONS STUDIES.

(4). SEE THE VARIOUS DON RESEARCH REPORTS FOR BACKGROUND IN RESPECT TO DEVELOPMENT OF ATTRIBUTE, SOCIAL FIELD, AND STATUS-FIELD THEORIES.

(5). RUMMEL DOES NOT PROVIDE AXIOMS FOR ATTRIBUTE THEORY. THESE HAVE BEEN WRITTEN BY VINCENT TO PARALLEL AS CLOSELY AS POSSIBLE THE AXIOMS OF SOCIAL FIELD THEORY.

(7). RUMMEL HAS DEVELOPED AND WORKED PRIMARILY WITH THIS

EQUATION.

(8). THE PURPOSE OF MULTIPLE REGRESSION IS TO PREDICT THE VALUES ON A SINGLE DEPENDENT VARIABLE FROM MORE THAN ONE PREDICTOR VARIABLE. TO SIMPLIFY THE DISCUSSION, IT WILL BE ASSUMED THAT ALL DATA IS IN THE FORM OF Z-SCORES. IF D IS THE DEPENDENT VARIABLE AND Y IS THE VARIABLE OF PREDICTED VALUES, THE SOLUTION TO A MULTIPLE REGRESSION PROBLEM MINIMIZES THE EXPRESSION: SUMMATION (D-Y) SQUARED. THUS, THE SMALLER OF THE SQUARE DIFFERENCES BETWEEN THE PREDICTED VALUES AND THE DEPENDENT VARIABLE, THE BETTER THE PREDICTION. THE Y IN THIS EXPRESSION IS COMPUTED BY THE EQUATION:

$$Y = \sum_{I=1}^{N} B_I P_I,$$

WHERE Y = THE PREDICTED VALUES, B = THE REGRESSION COEFFICIENTS AND = THE PREDICTORS. IN OTHER WORDS, EACH PREDICTOR IS WEIGHTED TO MINIMIZE THE EXPRESSION (D-Y)SQUARED. THE WEIGHTS ARE FOUND BY:

$$B_{1XN} = C_{1XN} R^{-1}_{NXN},$$

WERE B = A ROW VECTOR OF REGRESSION COEFFICIENTS, C = A ROW VECTOR OF CORRELATIONS OF THE PREDICTORS WITH THE DEPENDENT VARIABLE AND R = AN INTERCORRELATION MATRIX OF THE PREDICTORS. IT CAN BE SEEN, THEN, THAT ALL THAT IS NECESSARY TO PRODUCE THE WEIGHTS FOR A MULTIPLE REGRESSION IS AN INTERCORRELATION MATRIX OF THE PREDICTORS AND A VECTOR OF CORRELATIONS OF THE PREDICTORS WITH THE DEPENDENT VARIABLE. WHEN ONLY ONE VARIABLE, AS IN THIS STUDY, IS USED ON THE DEPENDENT SIDE, MULTIPLE REGRESSION AND CANONICAL CORRELATION YIELD THE SAME RESULTS.

(9). A CANONICAL CORRELATION ANALYSIS ASSIGNS WEIGHTS TO TWO SETS OF VARIABLES SO THAT THE SCORES GENERATED FROM THE TWO SETS ARE MAXIMALLY CORRELATED. THE CANONICAL VARIATE SCORES THEMSELVES, FOR ONE SET, CAN BE COMPUTATED BY THE FORMULA C = SW, WHERE C IS AN N X 1 VECTOR OF CANONICAL VARIATE SCORES, S IS AN N X M MATRIX OF SUBJECTS' STANDARD SCORES ON THE ORIGINAL VARIABLES, AND W IS A M X 1 VECTOR OF CANONICAL WEIGHTS, WHERE N = SUBJECT AND M = VARIABLES.

THIS FORMULA IS GIVEN HERE TO MAKE CLEAR THE MEANING OF CANONICAL VARIATE SCORES. THE ACTUAL CALCULATION OF THE WEIGHTS, OF COURSE, IS THE SOLUTION TO THE BASIC CANONICAL PROBLEM, WHICH IS TO MAXIMALLY CORRELATE TWO SUCH SETS OF SCORES, ONE GENERATED FROM ONE SET OF VARIABLES AND THE OTHER GENERATED FROM THE OTHER SET OF VARIABLES. WHEN WEIGHTS ARE CALCULATED WHERE THIS IS THE CASE, THE CANONICAL VARIATE SCORES PREDICT THE ORIGINAL VARIABLES TO THE EXTENT OF THEIR LOADINGS, IF THE ORIGINAL VARIABLES ARE MUTUALLY ORTHOGONAL IN EACH SET. LIKE FACTOR SCORES, A GREAT DEAL OF INFORMATION CAN BE SUMMARIZED BY PROPERLY COMPUTED CANONICAL VARIATE SCORES.

IF CORRELATED DATA ARE USED, THEN THE INDIVIDUAL IMPORTANCE OF THE PREDICTORS IS NOT CLEAR BY EXAMINATION OF CANONICAL WEIGHTS, FOR THE SAME REASONS AS IN THE APPLICATION OF MULTIPLE REGRESSION. THAT IS, THE WEIGHTS ARE ASSIGNED SO THAT ONLY UNIQUE VARIANCE IS CONSIDERED. IF THE VARIABLES ARE UNCORRELATED, HOWEVER, WEIGHTS WILL BE EQUAL TO THE CORRELATION OF THE VARIABLES WITH THE CANONICAL VARIATE SCORES.

ALTHOUGH ONLY ONE SET OF WEIGHTS IS LIKELY TO PRODUCE EXACTLY THE SAME MAXIMAL CORRELATION, NEVERTHELESS, DIFFERENT WEIGHTING SCHEMES MAY PRODUCE MORE THAN ONE STATISTICALLY SIGNIFICANT CANONICAL CORRELATION. WHEN ADDITIONAL CORRELATIONS ARE PRODUCED THROUGH DIFFERENT WEIGHTING SCHEMES, THEY ARE SUBJECTED TO THE RESTRICTION THAT THE SUBJECTS' CANONICAL VARIATE SCORES MUST BE ORTHOGONAL TO ALL PREVIOUSLY CALCULATED CANONICAL VARIATE SCORES. THUS, IF TWO SIGNIFICANT CANONICAL CORRELATIONS ARE PRODUCED, THE CANONICAL VARIATE SCORES IN THE SECOND CANONICAL CORRELATION WILL HAVE A ZERO CORRELATION WITH THE CANONICAL VARIATE SCORES OF THE FIRST CANONICAL CORRELATION. IF STATISTICAL SIGNIFICANCE IS IGNORED, THERE CAN BE AS MANY CANONICAL CORRELATIONS AS THERE ARE VARIABLES IN THE SMALLEST SET, AND THUS, AS MANY SETS OF CANONICAL VARIATE SCORES AS THERE ARE VARIABLES IN THE SMALLEST SET.

(10). SUMMING THE SQUARES OF THE PARAMETER WEIGHTS, BUT RETAINING THE ORIGINAL PARAMETER WEIGHT SIGNS, ACROSS STATES, WILL THE SAME SIGN RESULTS AS THE CITY BLOCK METHOD, AND BECAUSE OF THE SIMPLICITY OF PROCEDURE AND INTERPRETATION IT IS THE METHOD USED.

(11). MODEL 2, DESCRIBED HERE, IS THE ONLY ONE PRESENTLY UNDER CONSIDERATION. MODEL 1 WAS ESTABLISHED AS ANOTHER POSSIBLE APPROACH TO THE RELATIONSHIP OF DISTANCE TO CONFLICT AND COOPERATION BUT, SINCE EARLY PILOT TESTS SHOWED FEW POSITIVE RESULTS, IT WAS ABANDONDED.

(12). IF A NUMERICAL SEQUENCE SUCH AS 1, 3, 5 IS ASSIGNED THE NUMBERS 1, 2, 3, THE ORIGINAL NUMBERS HAVE BEEN CONVERTED TO RANK NUMBERS. THAT IS, EACH HIGHER GRADATION IN THE ORIGINAL

DISTRIBUTION IS GIVEN A HIGHER RANK SCORE. THUS, IF AN ORIGINAL DISTRIBUTION JUMPS (NO NUMBERS BETWEEN) FROM 5 TO 100, THE RANK DIFFERENCE WOULD ONLY BE ONE, SUCH AS FROM 3 TO 4 OR 5 TO 6. WHEN THIS IS DONE IT IS ASSUMED THAT EACH NUMERICAL GRADATION EXPRESSES ONE DEGREE DIFFERENCE IN RANK GRADITION, BUT THAT THE EXACT DIFFERENCE BETWEEN RANKS, IN INTERVAL TERMS, IS UNSPECIFIED. IT SHOULD BE APPARENT THAT CONVERTING RAW DISTRIBUTIONS TO RANK DISTRIBUTIONS >PULLS IN> DEVIATE CASES. FOR EXAMPLE, IF RAW = 1 2 100, THEN RANK = 1 2 3, AND 100 HAS BEEN >PULLED IN.>

(13). THE EIGENVALUES OF A SYMMETRIC MATRIX S MAY BE DEFINED AS: E = VSV' WHERE E IS A DIAGONAL MATRIX OF EIGENVALUES, AND V IS AN ORTHOGONAL MATRIX OF EIGENVECTORS. THE COMPUTATION OF EIGENVALUES IS FREQUENTLY THE FIRST STEP IN ADVANCED STATISTICAL APPLICATIONS SUCH AS FACTOR ANALYSIS.

THE EIGENVECTORS OF MATRIX A ARE GIVEN BY THE EXPRESSION: (A-E)V = 0, WHERE A IS A SQUARE MATRIX, E IS THE DIAGONAL MATRIX OF EIGENVALUES AND V IS A MATRIX COMPOSED OF EIGENVECTORS. THAT IS, WHEN THE MATRIX E IS SUBTRACTED FROM A, THE EIGENVECTOR MATRIX IS THAT MATRIX WHICH, IF PREMULTIPLIED BY A - E EQUALS A VECTOR OF ZEROS. IN THIS CONNECTION, USING A MATRIX OF ZEROS FOR V IS VIEWED AS TRIVIAL SOLUTION. EIGENVALUES HAVE CONSIDERABLE VALUE IN MANY KINDS OF APPLICATIONS. FOR EXAMPLE, THE EIGENVALUES OF A CORRELATION MATRIX ARE SCALED TO PRODUCE THE PRINCIPAL COMPONENT'S LOADINGS MATRIX IN FACTOR ANALYSIS.

(14). THE AVERAGE STANDARD ERROR FOR THE JUDGES WAS .20. THUS, REPEATED SAMPLES SHOULD FALL INTO LIMITS OF + OR .40 AROUND THE

MEANS REPORTED ABOVE, 95% OF THE TIME, IF REPEATED SAMPLES ARE TAKEN.

(15). BECAUSE ONLY ONE DEPENDANT VARIABLE WAS USED, THESE ARE THE EQUIVALENT OF A MULTIPLE REGRESSION ANALYSIS WITH THE CANONICAL CORRELATIONS EQUAL TO R.

(16). THE MODEL FOR ANY PARTICULAR STATE, OF COURSE, MAY BE FOUND BY REFERENCE TO TABLE 7. A LATER PAPER WILL EXPLORE THE MODELS THAT WERE DEVELOPED FOR SOME 30 PLUS MAJOR INTERNATIONAL GROUPINGS, SUCH AS NATO AND THE WARSAW PACT, BY APPLYING THE ABOVE DESCRIBED MODEL BUILDING TECHNIQUES.

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TABLES

NOTE! CERTAIN MATERIALS MAY BE TRUNCATED, WHERE TRUNCATION IS INDICATED BY A LINE OF **********, TO REDUCE REDUNDANCY OR FACILITATE FLOW. IF THE MATERIAL IS NOT FOUND IN ANOTHER MONOGRAPH, IT CAN BE FOUND, IN IT'S ENTIRETY, AT THE END OF THE MONOGRAPH.

TABLE 1

ROTATED LOADINGS OF A-SPACE

001 TOTAL POPULATION

-.23	.93	-.01	.06	.03	-.00
-.00	-.08	-.08	-.05	-.01	.01
-.04	-.03	-.02	.04	-.00	-.03
-.07	-.02	-.02	.02	.95	002

POPULATION GROWTH RATE, 1960-65

-.28	-.18	.07	-.04	-.83	.0

-40

.03 .01 .01 .11 .00 .19

-

.09 .05 -.03 -.04 .05 .02

-

-.03 -.02 .04 .01 .88 003

POPULATION GROWTH RATE, 1950-65

-.20 -.17 .10 -.01 -.82 .0

-

.02 .01 -.04 .09 .03 .14

-

.05 .15 -.07 -.06 .06 .06

-

-.04 -.02 -.02 .02 .83

****

COLUMN SUM OF SQUARES 31.17 30.98 5.98

7.94 4.44 4.09 3.61 3.64 3.59 2.34

3.64 2.21 2.05

3.06 2.16 2.00 1.62 1.62 1.51 1.58

1.84 1.57

FACTORS, SORTED

01 ECONOMIC DEVELOPMENT

085 NATIONAL GOVERNMENT REVENUE PER CAPITA

.92 087 NATIONAL GOVERNMENT EXPENDITURE PER CAPITA

.91 095 IMPORTS PER CAPITA

.91 031 GNP PER CAPITA (IN U.S. DOLLARS)

.90 058 EDUCATION EXPENDITURE PER CAPITA (IN MILLION U.S. DOLLARS)

.89 115 TOTAL HIGHWAY VEHICLES PER CAPITA

.89 111 PASSENGER CARS PER CAPITA

.88 116 GROSS DOMESTIC PRODUCT PER CAPITA

.88

****

02 POWER BASE

099 TOTAL PRIMARY SCHOOL ENROLLMENT

.94 107 TOTAL SCHOOL ENROLLMENT

.93 001 TOTAL POPULATION

.93 080 POPULATION IN CITIES OF 100,000+

.92 030 TOTAL GNP (IN MILLIONS U.S. DOLLARS)

.91 101 TOTAL SECONDARY SCHOOL ENROLLMENT

.90 082 POPULATION IN CITIES OF 50,000+

.89 088 RAILROAD MILEAGE

.88

****

03 POLITICAL INSTABILITY

142 MEAN UNSUCCESSFUL IRREGULAR POWER TRANSFERS, 1963-1967

.83 074 MILITARY REGIME

.81 137 MEAN NUMBER OF POLITICAL ASSASSINATIONS DURING 1963-1967

.77 075 MEAN NUMBER OF MAJOR CONSTITUTIONAL CHANGES, 1962-1966

.75 136 MEAN NUMBER OF IRREGULAR POWER TRANSFERS DURING 1963-1967

.73 143 MEAN NUMBER OF POLITICAL EXECUTIONS DURING 1963-1967

.73

04 NON-COMPETITIVE POLITICAL SYSTEM

078 LEGISLATIVE SELECTION

-.50 063 POLITICAL PARTY FRACTIONALIZATION BASED ON NUMBER OF SEATS, 1964

-.70 065 PRESS FREEDOM INDEX

-.71 064 ELECTORAL IRREGULARITY SCORE

-.76 126 SIZE OF LEGISLATURE/NUMBER OF SEATS HELD BY LARGEST PARTY

-.80 077 LEGISLATIVE EFFECTIVENESS

-.83 127 COMPETITIVENESS OF NOMINATING PROCESS

-.86 128 PARTY LEGITIMACY

-.87 129 AGGREGATE COMPETITION INDEX

-.88

****

TABLE 2

D-SPACE , ROTATED FACTOR LOADINGS

001 TOTAL POPULATION

.49 -.08 -.01 -.03 -.04

-.14 -.08 .07 -.01 -.04

.01 .59 -.01 .03 -.03

-.03 -.02 -.06 .16 .04

-.02 -.28 -.01 .03 -.04

-.04 .02 -.04 .01 -.07

-.00 .08 .05 .76

****

COLUMN SUM OF SQUARES 18.76 17.31 4.94

3.35 3.78 2.09 3.16 3.16 2.79 2.09

1.90 4.14 2.21

1.80 1.86 1.43 1.54 1.78 1.59 1.60

1.93 2.09 1.32

1.78 1.22 1.31 1.28 1.18 1.37 1.31

1.24 1.26 1.58

FACTORS, SORTED

01 POWER BASE DISTANCE

030 TOTAL GNP (IN MILLIONS U.S. DOLLARS)
.91 057 TOTAL EDUCATION EXPENDITURE (IN MILLION U.S. DOLLARS)
.88 119 TOTAL ENERGY CONSUMPTION IN METRIC TONS OF COAL EQUIVALENT
.86 098 PROPORTION OF TOTAL WORLD TRADE
.85 094 TOTAL IMPORTS
.85 036 TOTAL TRADE, 1960 (IN MILLIONS U.S. DOLLARS)
.83 114 TOTAL HIGHWAY VEHICLES
.82 096 TOTAL EXPORTS
.81

****

02 ECONOMIC DEVELOPMENT DISTANCE

085 NATIONAL GOVERNMENT REVENUE PER CAPITA
.88 031 GNP PER CAPITA (IN U.S. DOLLARS)
.87 087 NATIONAL GOVERNMENT EXPENDITURE PER CAPITA
.87 115 TOTAL HIGHWAY VEHICLES PER CAPITA
.86 111 PASSENGER CARS PER CAPITA
.84 116 GROSS DOMESTIC PRODUCT PER CAPITA

.84 093 TELEPHONES PER CAPITA

.84

****

03 POLITICAL DISTANCE

129 AGGREGATE COMPETITION INDEX

.87 128 PARTY LEGITIMACY

.84 127 COMPETITIVENESS OF NOMINATING PROCESS

.82 077 LEGISLATIVE EFFECTIVENESS

.80 126 SIZE OF LEGISLATURE/NUMBER OF SEATS HELD BY LARGEST PARTY

.78 064 ELECTORAL IRREGULARITY SCORE

.61 065 PRESS FREEDOM INDEX

.58 063 POLITICAL PARTY FRACTIONALIZATION BASED ON NUMBER OF SEATS, 1964 .55

04 SCHOOL ENROLLMENT DISTANCE

104 PRIMARY AND SECONDARY ENROLLMENT PER CAPITA

.92 108 TOTAL SCHOOL ENROLLMENT PER CAPITA

.90 100 PRIMARY SCHOOL ENROLLMENT PER CAPITA

.89

****

TABLE 3

WEIS CONFLICT AND COOPERATION CLASSIFICATIONS

CONFLICT

1. REJECT	2.6	2. ACCUSE	2.9
3. PROTEST	2.4	4. DENY	2.2
5. DEMAND	3.4	6. WARN	3.3
7. THREATEN	3.9	8. DEMONSTRATE	3.0
9. REDUCE RELATIONSHIP	3.5	10. EXPEL	3.8
11. SEIZE	4.5	12. FORCE	4.7

COOPERATION 1. YIELD 3.5 2. APPROVE 2.9 3. PROMISE 3.0 4. GRANT 3.3 5. REWARD 4.5 6. AGREE 3.0 7. REQUEST 2.7 8. PROPOSE 2.8

(THE NUMBERS, NEXT TO THE VARIABLES, ARE THE ADDITIVE WEIGHTS EXPLAINED BELOW)

TABLE 4

WEIS TOTAL COOPERATION SCORES

1	AFGHANISTAN	5.70
2	ALBANIA	31.30
3	ALGERIA	71.20
4	ARGENTINA	30.70
5	AUSTRALIA	165.20

****

TABLE 5

CANONICAL CORRELATIONS FOR 128 STATES

76	NIGERIA	.72			
17	CEYLON	.69			
50	IRAQ	.69	115	GAMBIA	
.68	110 NORTH VIETNAM		.67		
11	BURMA	.66			
39	GHANA	.64			
69	MONGOLIA	.64			
10	BULGARIA	.64	108	URUGUAY	
.63					
9	BRAZIL	.63	113	YUGOSLAVIA	
.63					

30	DOMINICAN REPUBLIC	.63			
96	SYRIA	.63	126	MALAYSIA	
.62					
53	ITALY	.62			
25	CUBA	.62			
60	LAOS	.62	125	GUYANA	
.62					
84	PORTUGAL	.62			
21	COLOMBIA	.61	103	U.S.S.R	
.61	120 TANZANIA	.61			
59	SOUTH KOREA	.61			
20	CHINA, PR	.61	104	U.A.R.	
.61					
47	INDIA	.61			
95	SWITZERLAND	.61			
72	NETHERLANDS	.61	105	UNITED KINGDOM	
.61	106 UNITED STATES	.60			
83	POLAND	.60			
90	SOMALIA	.60			
52	ISRAEL	.60	100	TUNISIA	
.60					
31	ECUADOR	.60			
85	ROMANIA	.60			
34	FINLAND	.60			
86	RWANDA	.59			
94	SWEDEN	.59			

27 CZECHOSLOVAKIA .59

56 JAPAN .59

6 AUSTRIA .59

8 BOLIVIA .59 111 SOUTH VIETNAM

.59

91 SOUTH AFRICA .59

58 NORTH KOREA .59

37 EAST GERMANY .59

97 THAILAND .59

19 CHILE .59

2 ALBANIA .59

77 NORWAY .58

79 PANAMA .58

4 ARGENTINA .58

61 LEBANON .58

7 BELGIUM .58

93 SUDAN .58 128 BARBADOS

.58

44 HONDURAS .58

45 HUNGARY .58

38 WEST GERMANY .58

33 ETHIOPIA .58

5 AUSTRALIA .58

48 INDONESIA .58

92 SPAIN .57

29 DENMARK .57 112 YEMEN

.57

3 ALGERIA .57 122 KENYA

.57

87 SAUDI ARABIA .57

15 CANADA .57

49 IRAN .57 121 ZAMBIA

.57

1 AFGHANISTAN .56

35 FRANCE .56 124 SINGAPORE

.56 118 MALAWI .56

12 BURUNDI .55

73 NEW ZEALAND .55 101 TURKEY

.55

78 PAKISTAN .55

13 CAMBODIA .55

26 CYPRUS .54

62 LIBERIA .54 119 MALTA

.54

23 CONGO (LEO) .54

74 NICARAGUA .53

40 GREECE .53

57 JORDAN .53

32 EL SALVADOR .53

43 HAITI .53

81 PERU .52

18 CHAD .52

67	MAURITANIA	.52	102	UGANDA	
.52					
51	IRELAND	.52			
63	LIBYA	.52	116	KUWAIT	
.51					
70	MOROCCO	.51	127	MALDIVE ISLANDS	
.51					
16	CENTRAL AFRICAN REP	.51			
68	MEXICO	.51			
75	NIGER	.50			
71	NEPAL	.50			
41	GUATEMALA	.50			
42	GUINEA	.49			
24	COSTA RICA	.48			
36	GABON	.48			
82	PHILIPPINES	.47			
22	CONGO (BRA)	.46			
98	TOGO	.45	109	VENEZUELA	
.45					
65	MALAGASY REP	.45			
88	SENEGAL	.42			
89	SIERRA LEONE	.41			
54	IVORY COAST	.39	117	LESOTHO	
.00					
55	JAMAICA	.00			
64	LUXEMBOURG	.00			

46	ICELAND	.00			
80	PARAGUAY	.00	107	UPPER VOLTA	.00
123	W. SAMOA	.00			
99	TRINIDAD	.00			
28	DAHOMEY	.00			
14	CAMEROUN	.00			
66	MALI	.00	114	BOTSWANA	.00

TABLE 6

DISTANCE THEORY, SOME ANALYTICAL COMPARISONS

1.NO. OF CORRELATIONS 116 2.N OF CORRELATIONS 128 3.RANGE OF CORRELATIONS 73 TO 39 4.EXPECTED CORRELATION .50 5.NO. ABOVE EXPECTED CORRELATION 102. 6.% ABOVE EXPECTED CORRELATION 88. 7.EXPECTED AVERAGE SQUARE .25 8.ACTUAL AVERAGE SQUARE .33 9.AVERAGE SQUARE ABOVE EXPECTED SQUARE .08 10.TOTAL DYADS CONSIDERED 14848 11.COL. SUMS OF SQUARES OF CANONICAL CORRELATIONS 37.86 12.% OF TOTAL VARIANCE OF THEORETICAL MAXIMUM 33%

TABLE 7

CANONICAL WEIGHTS

1	AFGHANISTAN			.31	-.04	.24	
.08	.03	-.29	-.23	-.03	.04	.10	
				.30	.11	.05	
.15	-.07	-.26	.07	.12	-.17	.22	
				.38	.10	.01	
.01	.17	-.16	.14	-.19	.07	.06	
				.13	-.22	-.04	
.95							
2	ALBANIA			.55	-.21	-.17	
-.01	.00	.05	-.33	-.21	.43	-.54	
				-.25	.25	.06	
-.25	-.03	.36	.02	-.03	.31	.16	
				-.08	-.07	-.10	
.03	-.05	.03	-.15	.19	-.02	-.29	
				-.10	.13	.22	
1.52							
3	ALGERIA			-.21	.22	.06	
-.08	-.09	.27	.09	.23	-.12	.08	
				-.29	.06	-.28	
-.02	.23	-.08	-.20	-.12	-.29	.15	
				-.27	.12	-.10	
.03	-.28	-.12	.05	.00	.19	.03	

				-.21	.04	-.23	
.98							
4	ARGENTINA			-.17	-.15	.43	
.01	-.13	.29	.05	-.26	-.24	-.09	
				.13	-.01	-.26	
-.06	.15	-.05	-.01	-.28	.17	.11	
				-.18	.40	-.15	
-.33	-.09	-.11	.03	.34	-.19	.09	
				-.23	.14	.19	
1.32							

****

COLUMN SUM OF SQUARES			9.83	5.09	3.60	
4.01	2.57	5.35	7.12	4.65	3.76	3.92
				3.56	7.33	4.60
7.74	3.48	4.09	2.96	5.03	4.49	3.54
				5.32	6.53	4.76
4.74	3.46	3.29	3.38	4.05	3.47	3.47
				3.65	7.46	4.71

TABLE 8

TWENTY HIGHEST AND LOWEST

WEIGHTS FOR SELECTED FACTORS

01 POWER BASE DISTANCE

63	LIBYA	.51			
39	GHANA	.49	110	NORTH VIETNAM	
.47					
57	JORDAN	.45	112	YEMEN	
.45					
23	CONGO (LEO)	.44	115	GAMBIA	
.39	121 ZAMBIA	.39			
31	ECUADOR	.38	100	TUNISIA	
.38	120 TANZANIA	.38			
33	ETHIOPIA	.36	118	MALAWI	
.36					
2	ALBANIA	.35			
8	BOLIVIA	.35	124	SINGAPORE	
.34					
36	GABON	.33			
79	PANAMA	.33			
96	SYRIA	.33			
11	BURMA	.33			
68	MEXICO	-.24			
92	SPAIN	-.26			
7	BELGIUM	-.29	109	VENEZUELA	

-.30

47	INDIA	-.51			
95	SWITZERLAND	-.33			
27	CZECHOSLOVAKIA	-.36			
37	EAST GERMANY	-.37			
85	ROMANIA	-.41			
15	CANADA	-.42			
56	JAPAN	-.42			
72	NETHERLANDS	-.43			
9	BRAZIL	-.43			
83	POLAND	-.49			
53	ITALY	-.53	103	U.S.S.R	

-.55

35	FRANCE	-.60	105	UNITED KINGDOM	

-.62

38	WEST GERMANY	-.63	106	UNITED STATES	

-.64

02 ECONOMIC DEVELOPMENT DISTANCE

128	BARBADOS	.51			
65	MALAGASY REP	.42			
9	BRAZIL	.39			
67	MAURITANIA	.37	101	TURKEY	

.37

39	GHANA	.35	115	GAMBIA	
.35	104 U.A.R.	.31			
76	NIGERIA	.30	100	TUNISIA	
.29					
57	JORDAN	.28	110	NORTH VIETNAM	
.27					
75	NIGER	.25			
21	COLOMBIA	.24			
23	CONGO (LEO)	.24			
31	ECUADOR	.24			
43	HAITI	.24			
54	IVORY COAST	.24	112	YEMEN	
.24					
82	PHILIPPINES	.23	109	VENEZUELA	
-.23	102 UGANDA	-.23	119	MALTA	
-.24					
73	NEW ZEALAND	-.24			
15	CANADA	-.25			
6	AUSTRIA	-.26			
27	CZECHOSLOVAKIA	-.26			
11	BURMA	-.26			
32	EL SALVADOR	-.26			
77	NORWAY	-.27			
10	BULGARIA	-.27			
45	HUNGARY	-.29			
98	TOGO	-.29			

41	GUATEMALA	-.31
37	EAST GERMANY	-.31
12	BURUNDI	-.31
35	FRANCE	-.31
29	DENMARK	-.34
38	WEST GERMANY	-.38
95	SWITZERLAND	-.40

03 POLITICAL DISTANCE

48	INDONESIA	.44
4	ARGENTINA	.43

121 ZAMBIA .41

9	BRAZIL	.38
67	MAURITANIA	.38
8	BOLIVIA	.34
36	GABON	.34
75	NIGER	.27
32	EL SALVADOR	.26
63	LIBYA	.26
88	SENEGAL	.25
92	SPAIN	.25
43	HAITI	.24
1	AFGHANISTAN	.24
49	IRAN	.24
31	ECUADOR	.23

57 JORDAN .23

89 SIERRA LEONE .23

13 CAMBODIA .21

11 BURMA .21

81 PERU -.15 125 GUYANA

-.16

40 GREECE -.16

47 INDIA -.17

2 ALBANIA -.17

24 COSTA RICA -.18 105 UNITED KINGDOM

-.18

22 CONGO (BRA) -.19

94 SWEDEN -.19

91 SOUTH AFRICA -.20

73 NEW ZEALAND -.20

95 SWITZERLAND -.21

18 CHAD -.21

74 NICARAGUA -.23 115 GAMBIA

-.24 122 KENYA -.25

53 ITALY -.26

16 CENTRAL AFRICAN REP -.30 101 TURKEY

-.31

51 IRELAND -.34

TABLE 9

A-SPACE CORRELATIONS WITH SELECTED FACTORS

(NUMBERS, SUCH AS 1, REFER TO FACTOR NUMBERS, SEE BELOW)

CORRELATION OF A-SPACE WITH + WEIGHTS,

POWER BASE DISTANCE

(NO SIGNIFICANT RELATIONSHIPS)

CORRELATION OF A-SPACE WITH + WEIGHTS,

ECONOMIC DEVELOPMENT DISTANCE

1	N=	56	P=	.0125	R= -.3300

CORRELATION OF A-SPACE WITH + WEIGHTS,

POLITICAL DISTANCE

7	N=	61	P=	.0405	R= -.2600
9	N=	61	P=	.0491	R= -.2500

CORRELATION OF A-SPACE WITH - WEIGHTS,

POWER BASE DISTANCE

1	N=	50	P=	.0122	R= -.3500
2	N=	50	P=	.0001	R= -.5600

CORRELATION OF A-SPACE WITH - WEIGHTS,

ECONOMIC DEVELOPMENT DISTANCE

7	N=	59	P=	.0006	R= .4500
9	N=	59	P=	.0441	R= -.2600

20 N= 59 P= .0066 R= .3500

CORRELATION OF A-SPACE WITH - WEIGHTS,

POLITICAL DISTANCE

(NO SIGNIFICANT RELATIONSHIPS)

TABLE 10

F-TEST OF - VS. + WEIGHTS,

POWER BASE DISTANCE

1 11.6664 .0012

2 61.5500 .0000 G MEA 1 1 .3449 -.2569 G MEA 2 1 .7584 -.4281

F TEST OF - VS + WEIGHTS,

ECONOMIC DEVELOPMENT DISTANCE

1 25.0071 .0000

3 5.0156 .0254

14 3.8351 .0497 G MEA 1 1 .3983 -.4372 G MEA 3 1 -.1934 .2185 G MEA 14 1 -.1895 .1812

F TEST OF - VS + WEIGHTS,

POLITICAL DISTANCE

4 17.8580 .0002 G MEA 4 1 -.4033 .3504

TABLE 11

GENERAL MODEL, DISTANCE THEORY, WORLD SYSTEM

1. WORLD .29 .23 1.16

.17 -1.10 -.84 -2.49 -.82 -2.24 -2.11

-2.01 -.08 -4.22

2.46 -1.62 .23 .30 -1.23 -2.28 .73

.26 -2.34 .84

-1.24 -.51 -.27 .97 1.37 -.13 -.52

.04 1.56 1.72

TABLE 12

CONTRIBUTIONS OF THE FACTORS TO COOPERATION
IN DISTANCE OR CLOSENESS TERMS

FACTORS WHERE DISTANCE PREDICTS COOPERATION

01 POWER BASE 02 ECONOMIC DEVELOPMENT 03 POLITICAL 04 SCHOOL ENROLLMENT 06 INTERNAL VIOLENCE 14 ENERGY PRODUCTION 19 ALL MAIL 21 DOMESTIC TURMOIL 23 PER CAPITA ENERGY CONSUMPTION GROWTH RATE 24 INFANT MORTALITY 25 AGE OF CURRENCY 26 TOTAL HEALTH EXPENDITURE 30 CONCENTRATION OF EXPORT COMMODITIES 31 MEAN ELECTIONS 32 CONCENTRATION OF EXPORT RECEIVERS 33 ORTHODOX COMMUNITY

FACTORS WHERE CLOSENESS PREDICTS COOPERATION

05 INTERNAL POLITICAL TURMOIL 07 MILITARISM 08 DATE OF INDEPENDENCE 09 POPULATION GROWTH RATE 10 DENSITY 11 INTERNAL SECURITY FORCES 12 POPULATION SIZE 13 RELIGIOUS 15 GNP GROWTH RATE 16 FIXED PRICES GNP GROWTH RATE 17 ETHNO-LINGUISTIC FRACTIONALIZATION 18 PER CENT URBAN POPULATION 20 POLITICAL PARTY FRACTIONALIZATION 22 TOTAL AREA 27 CRUDE DEATH RATE 28 REGULAR EXECUTIVE TRANSFERS 29 PER CAPITA ECONOMIC ACTIVE MALE POPULATION

TABLE 1-1.

FIGURES AND ILLUSTRATIONS.

(1).

ATTRIBUTE THEORY

A-SPACE		B-SPACE
MONADIC FACTOR SCORES	PREDICT	MONADIC BEHAVIOR SCORES

(2).

SOCIAL FIELD THEORY

A-SPACE		B-SPACE
DYADIC ALGEBRAIC DISTANCE COMPUTED FROM	PREDICT	DYADIC BEHAVIOR

MONADIC FACTOR SCORES SCORES

(3).

IMPLICATIONS OF RUMMEL'S DISTANCE METRIC (CONDITION OF PERFECT POSITIVE FIT)

BIG - NUMBER, NUMBER, J FAR ABOVE I BIG + NUMBER, MUCH COOPERATION

0 NUMBER, J SAME AS I MEAN NUMBER, AVERAGE COOPERATION

BIG + NUMBER, J FAR BELOW I BIG - NUMBER, LITTLE COOPERATION

(4).

ABSOLUTE DISTANCE METRIC (CONDITION OF PERFECT

POSITIVE FIT)

BIG + NUMBER, J VERY DISTANT FROM I BIG + NUMBER, MUCH COOPERATION

MEDIUM + NUMBER, J AVERAGE DISTANCE FROM I MEDIUM + NUMBER, AVERAGE COOPERATION

0 NUMBER, J SAME AS I 0 NUMBER, LITTLE COOPERATION

(5).

MODEL OF DISTANCE THEORY

D-SPACE		B-SPACE
DYADIC FACTOR SCORES COMPUTED FROM ABSOLUTE DISTANCES OF ORIGINAL VARIABLES	PREDICT	DYADIC BEHAVIOR SCORES

(6).

EXPECTATIONS IN DISTANCE THEORY

DEPENDING ON OBSERVED SIGN

DISTANCE THEORY, SIGN INTERPRETATION OF CONFLICT AND COOPERATION FLOWS

WHEN I EXPORTS TO J

I EXPORTS MOST TO FAR J'S ON THE FACTOR AND LEAST TO CLOSE J'S WHEN

+ SIGN ON A FARNESS FACTOR OR

- SIGN ON A CLOSENESS FACTOR

I EXPORTS LEAST TO FAR J'S ON THE FACTOR AND MOST TO CLOSE J'S WHEN

- SIGN ON A FARNESS FACTOR OR

+ SIGN ON A CLOSENESS FACTOR

(7).

CORRELATIONS, SUMMARY

TYPE OF STATE WITH BIG + WEIGHT,
POWER BASE DISTANCE

(TENDS TO EXPORT COOPERATION TO THOSE DISTANT)

NO SIGNIFICANT RELATIONSHIPS FOUND

TYPE OF STATE WITH BIG + WEIGHT,
ECONOMIC DEVELOPMENT DISTANCE

(TENDS TO EXPORT COOPERATION TO THOSE DISTANT)

UNDERDEVELOPED

TYPE OF STATE WITH BIG + WEIGHT,
POLITICAL DISTANCE

(TENDS TO EXPORT COOPERATION TO THOSE DISTANT)

LARGE CHRISTIAN COMMUNITY

MUCH DOMESTIC VIOLENCE

TYPE OF STATE WITH BIG - WEIGHT,

POWER BASE DISTANCE

(TENDS TO EXPORT MOST COOPERATION TO THOSE CLOSE)

DEVELOPED

LARGE POWER BASE

TYPE OF STATE WITH BIG - WEIGHT,

ECONOMIC DEVELOPMENT DISTANCE

(TENDS TO EXPORT MOST COOPERATION TO THOSE CLOSE)

LARGE CHRISTIAN COMMUNITY

LITTLE DOMESTIC VIOLENCE

HIGH CRUDE DEATH RATE

TYPE OF STATE WITH BIG - WEIGHT,

POLITICAL DISTANCE

(TENDS TO EXPORT MOST COOPERATION TO THOSE CLOSE)

NO SIGNIFICANT RELATIONSHIP FOUND

(8).

F-TEST OF MEANS, SUMMARY

TYPE OF STATE WITH + WEIGHT,

POWER BASE DISTANCE

(TENDS TO EXPORT MOST COOPERATION TO THOSE DISTANT)

UNDERDEVELOPED

LOW POWER BASE

TYPE OF STATE WITH - WEIGHT,

POWER BASE DISTANCE

(TENDS TO EXPORT MOST COOPERATION TO THOSE CLOSE)

DEVELOPED

HIGH POWER BASE

TYPE OF STATE WITH + WEIGHT,

ECONOMIC DEVELOPMENT DISTANCE

(TENDS TO EXPORT MOST COOPERATION TO THOSE DISTANT)

UNDERDEVELOPED

POLITICALLY UNSTABLE

HIGH PER CAPITA SCHOOL ENROLLMENT

TYPE OF STATE WITH - WEIGHT,

ECONOMIC DEVELOPMENT DISTANCE

(TENDS TO EXPORT MOST COOPERATION TO THOSE CLOSE)

DEVELOPED

POLITICALLY STABLE

LOW PER CAPITA SCHOOL ENROLLMENT

TYPE OF STATE WITH + WEIGHT,

POLITICAL DISTANCE

(TENDS TO EXPORT MOST COOPERATION TO THOSE DISTANT)

NON-COMPETITIVE POLITICAL SYSTEM

TYPE OF STATE WITH - WEIGHT,

POLITICAL DISTANCE

(TENDS TO EXPORT MOST COOPERATION TO THOSE CLOSE)

COMPETITIVE POLITICAL SYSTEM

COMPLETE VERSION OF TABLE 7

CANONICAL WEIGHTS

1	AFGHANISTAN			.31	-.04	.24	
.08	.03	-.29	-.23	-.03	.04	.10	
				.30	.11	.05	
.15	-.07	-.26	.07	.12	-.17	.22	
				.38	.10	.01	
.01	.17	-.16	.14	-.19	.07	.06	
				.13	-.22	-.04	
.95							
2	ALBANIA			.35	-.21	-.17	
-.01	.00	.05	-.33	-.21	.43	-.54	
				-.25	.25	.06	
-.25	-.03	.36	.02	-.03	.31	.16	
				-.08	-.07	-.10	
.03	-.05	.03	-.15	.19	-.02	-.29	
				-.10	.13	.22	
1.52							
3	ALGERIA			-.21	.22	.06	
-.08	-.09	.27	.09	.23	-.12	.08	
				-.29	.06	-.28	
-.02	.23	-.08	-.20	-.12	-.29	.15	
				-.27	.12	-.10	
.03	-.28	-.12	.05	.00	.19	.03	
				-.21	.04	-.23	
.98							
4	ARGENTINA			-.17	-.15	.43	
.01	-.13	.29	.05	-.26	-.24	-.09	
				.13	-.01	-.26	
-.06	.15	-.05	-.01	-.28	.17	.11	
				-.18	.40	-.15	
-.33	-.09	-.11	.03	.34	-.19	.09	
				-.23	.14	.19	
1.32							
5	AUSTRALIA			-.18	-.18	-.08	
-.06	.22	-.44	.06	.18	-.19	.20	

-.02 .06 -.20 .18 -.01 .00 -.01
-.19 .37 .23
.10 .02 -.05 .05 -.07 .29 -.21
.00 .11 -.26
.97 -.05 -.06 .04

6 AUSTRIA -.23 -.26 .16
.55 .00 -.21 .38 -.22 -.13 -.06
-.26 .44 -.06
-.09 -.19 .09 .14 -.11 .21 -.02
.17 -.58 .01
.12 .06 .02 -.19 .12 -.11 .13
-.15 .07 .23
1.46

7 BELGIUM -.29 -.08 .13
.08 .16 -.29 -.08 -.01 -.24 .12
-.15 .30 -.08
.01 .10 -.11 .02 .03 .01 -.10
-.17 -.48 -.30
.36 .02 -.05 -.10 -.13 .14 -.26
.08 .12 .05
1.07

8 BOLIVIA .35 .14 .34
-.15 .00 .18 -.10 -.41 -.16 -.20
.00 .14 -.30
.24 -.19 .08 .08 -.05 -.40 .21
-.42 .24 .03
.13 -.11 -.03 -.25 .19 .09 .05
-.26 .25 .16
1.51

9 BRAZIL -.43 .39 .38
.24 -.10 .11 .32 -.25 .29 .25
-.34 -.30 -.32
.49 -.17 .15 .00 -.19 .21 .24
-.18 .36 -.25
-.31 .37 .00 .25 .00 .05 .10
-.34 .01 -.10
2.27

10 BULGARIA -.14 -.27 .02
-.05 -.03 -.16 -.31 .01 -.18 -.09
-.12 .11 .04
-.10 -.13 .28 .01 .23 -.05 .13
.24 -.25 .39
.07 .10 .03 .11 .20 -.18 .07
-.10 .43 .32
1.14

11 BURMA .33 -.26 .21
-.03 .00 .18 -.04 -.34 -.17 -.03
-.17 -.15 -.22
.01 .07 .07 -.20 -.31 -.36 .03

```
                                                .02          .05          -.05
-.02          -.29          .22          -.06     -.19          .15          .02
                                                .18          -.15         -.01
1.03
 12  BURUNDI                                    .13          -.31          .20
-.05          -.22          -.33         -.09     -.18          -.10         -.13
                                               -.22          .03          -.13
.01           -.25          .16          -.26     -.21          .15          .03
                                                .04          -.26         -.01
-.31          -.30          .12           .19     -.03          -.05          .07
                                               -.04          -.01         -.08
.99
 13  CAMBODIA                                   .32           .22          .21
.09           .12           -.33         -.06      .12          -.09         -.02
                                                .05          -.01         -.19
.31           -.25          -.08          .28     -.05          -.22         -.08
                                                .05          -.06          .27
.00           -.01          -.01         -.04      .25          -.08         -.24
                                                .18          -.03         -.01
.93
 14  CAMEROUN                                   .00           .00          .00
.00           .00           .00          .00       .00          .00          .00
                                                .00          .00          .00
.00           .00           .00          .00       .00          .00          .00
                                                .00          .00          .00
.00           .00           .00          .00       .00          .00          .00
                                                .00          .00          .00
.00
 15  CANADA                                    -.42          -.25         -.03
-.23           .11           .00           .25      .10          -.17          .05
                                                .12          .29          -.12
-.29           .23           -.17         -.03     -.01          .17          -.01
                                               -.08          .33          -.33
.23           -.12           .11          -.05      .18          .38          -.19
                                               -.37          .19           .19
1.45
 16  CENTRAL AFRICAN REP                       -.18          -.16         -.30
-.15          -.12          -.14          -.17     -.25          .00          -.35
                                               -.20          -.06         -.28
-.23          -.24           .01          -.35      .03          .00          -.34
                                               -.19          -.09         -.20
-.43          -.18          -.05          -.10     -.01          .16           .11
                                                .01          -.26          .25
1.37
 17  CEYLON                                     .27          -.02          .08
-.01           .09          -.33           .41     -.03          -.12         -.34
                                                .03          -.27         -.20
.25            .04          -.09           .18     -.09          .03          -.12
                                                .30          -.48          .03
.18           -.15          -.08          -.20      .24          .22          -.02
```

				.04	.02	.19
1.30						
18	CHAD			-.06	-.11	-.21
-.12	-.11	-.33	-.13	-.13	-.10	-.27
				-.10	.06	-.19
-.16	-.27	.08	.00	-.03	-.02	-.30
				-.26	.20	.15
-.30	-.09	-.09	-.05	.06	.21	.14
				.06	-.16	.13
.91						
19	CHILE			.10	.00	.02
-.22	.02	-.03	.01	-.42	.11	-.08
				-.18	-.04	-.30
-.13	-.11	-.05	.06	-.29	-.04	.26
				-.17	.30	-.24
-.29	.02	.11	-.05	.26	-.05	-.08
				.10	.33	.06
1.04						
20	CHINA, PR			-.20	.13	.00
-.01	.06	.08	-.03	.05	-.06	-.1
				.23	-.55	-.30
-.20	-.28	-.07	-.07	.19	-.43	.30
				.09	.09	-.01
-.09	-.29	-.14	.34	.17	-.02	.22
				.38	.01	-.20
1.50						
21	COLOMBIA			-.01	.24	.00
.23	.23	.32	.16	-.41	.05	-.15
				-.17	-.12	-.25
-.16	.04	-.10	.01	-.41	-.05	.21
				-.14	.19	.19
-.10	.06	-.43	.18	.00	.03	-.15
				-.35	.48	-.02
1.54						
22	CONGO (BRA)			.19	.06	-.19
-.22	.05	-.27	.24	.01	-.10	.05
				-.22	.16	-.01
-.26	.49	-.17	.20	-.22	.18	.06
				-.08	.13	-.07
.20	.29	-.27	-.09	.28	-.01	-.20
				.03	-.06	-.30
1.25						
23	CONGO (LED)			.44	.24	-.01
-.06	-.07	.14	.20	.07	-.28	-.06
				-.14	-.08	-.33
.23	-.05	-.13	.28	-.28	-.18	.08
				.08	.18	-.30
.08	-.04	-.02	-.03	-.04	.05	-.14
				.06	.24	.04
1.03						

24 COSTA RICA
-.23 .05 -.17 .16 .28 .03 -.18
-.22 .02 -.33
-.01 .03 -.26
.17 -.27 .17 .16 .06 -.18 .22
.24 -.21 -.27
-.41 .29 .08 -.03 .24 -.17 -.04
-.11 .09 .18
1.26

25 CUBA
-.04 -.16 .16
-.07 -.05 .29 -.36 .20 .03 .05
-.07 .21 -.18
.44 .16 -.12 -.01 -.38 -.27 .24
.24 -.17 -.04
.08 -.09 .27 .24 -.10 .08 .18
.29 .07 -.27
1.35

26 CYPRUS
.11 -.07 -.08
-.21 .05 .26 .28 .18 -.05 -.42
-.10 .25 .24
-.32 -.18 .13 .11 -.13 .13 .35
.19 -.18 -.17
-.02 .07 .28 .00 -.38 -.05 .02
.17 -.28 .11
1.33

27 CZECHOSLOVAKIA
-.36 -.26 .00
-.09 .06 .03 -.32 .14 -.19 .06
-.12 .22 -.02
-.31 -.14 .07 .09 .41 -.06 .35
.09 -.28 .04
.09 -.06 .30 -.20 .08 .07 .16
-.06 .15 .20
1.19

28 DAHOMEY
.00 .00 .00
.00 .00 .00 .00 .00 .00 .00
.00 .00 .00
.00 .00 .00 .00 .00 .00 .00
.00 .00 .00
.00 .00 .00 .00 .00 .00 .00
.00 .00 .00
.00

29 DENMARK
-.16 -.34 -.08
.40 .07 -.16 -.17 -.20 -.22 -.06
-.10 .37 -.24
.42 -.01 -.32 .03 -.28 -.26 -.13
.18 -.29 -.09
.33 -.06 .21 -.04 .06 .08 .00
-.22 .11 -.08
1.47

30 DOMINICAN REPUBLIC
.06 -.21 .08
-.17 .10 -.07 .13 -.32 -.28 .16

-.12 .08 .50 .26 .01 -.01 -.32
-.02 -.29 .02
-.06 -.04 .13
.11 .06 .05 -.24 -.10 .01 -.35
-.01 .15 .28
1.18

31 ECUADOR

-.05 .01 .03 .15 .38 .24 .23
-.23 .03 -.19
.04 .04 -.12
.33 -.05 -.12 .20 -.22 -.03 .18
.00 -.19 .13
-.23 .16 -.11 .06 .06 -.22 -.09
.15 .39 .00
1.02

32 EL SALVADOR

-.16 -.26 .26
.18 .17 -.25 -.03 -.17 -.18 -.09
-.20 -.08 -.23
-.11 .08 .28 -.21 -.11 -.17 .16
-.29 .13 -.08
.14 -.17 -.08 .07 .07 .15 -.25
-.16 -.03 .26
1.01

33 ETHIOPIA

.36 -.15 .13
-.11 .14 -.13 .11 -.07 -.16 .01
.01 .12 -.19
.36 .11 .27 .04 -.03 -.33 .16
.17 .44 .19
-.07 .23 .20 -.24 -.15 .01 -.08
.12 .22 .03
1.17

34 FINLAND

-.13 -.08 .15
-.10 .14 -.07 .02 -.08 -.23 -.20
-.14 .39 .13
.30 .11 -.05 -.03 .02 .07 -.31
.08 -.41 -.18
.27 -.04 .18 -.35 .21 .14 -.12
-.30 .13 .27
1.27

35 FRANCE

-.60 -.31 -.09
.03 .04 -.01 -.34 -.24 -.34 .08
-.11 -.46 .10
-.19 .07 -.07 .00 .38 .16 -.05
-.02 .12 -.44
.05 -.12 -.36 -.10 -.33 -.06 -.12
.05 -.16 .18
1.77

36 GABON

.33 .12 .34
-.13 .01 -.02 .05 .35 -.23 .05
-.09 .18 -.30
-.11 -.01 .19 .13 .03 -.27 .05

.49 -.22 -.04
.02 -.16 .12 .19 .17 -.22 -.16
-.01 .21 -.33
1.33
37 EAST GERMANY -.37 -.31 .18
.15 -.26 .17 -.05 -.10 -.23 -.19
-.22 -.15 -.27
-.39 .03 .02 .05 .34 -.20 -.11
.13 -.01 -.24
.39 .22 .21 .23 .09 .22 .30
-.18 .27 .28
1.66
38 WEST GERMANY -.63 -.38 -.02
.48 -.04 .15 -.17 .05 -.29 -.14
-.21 -.35 -.23
-.40 -.19 -.39 .06 .03 .02 .05
-.22 -.08 -.24
.30 .25 -.18 .27 -.02 -.15 .17
.30 -.41 -.17
2.22
39 GHANA .49 .35 .12
-.11 -.07 .31 .18 .27 .19 -.21
-.02 -.07 -.33
.48 .13 .12 -.08 -.13 -.12 -.19
.16 -.17 -.08
-.16 -.02 -.28 .38 .49 .03 -.17
.29 -.06 .14
1.81
40 GREECE -.02 -.05 -.16
-.04 .25 .31 -.33 -.18 -.20 -.31
-.18 .09 -.14
.35 -.18 .24 .14 -.18 .04 -.20
-.27 -.22 .37
-.22 .15 -.03 .13 .10 -.30 .05
.01 -.33 .40
1.55
41 GUATEMALA -.06 -.31 .07
-.05 -.09 -.04 -.06 -.17 -.15 -.17
-.22 -.06 -.14
-.20 .06 .27 -.26 -.02 -.20 .06
-.16 .10 -.06
.08 -.28 .14 -.34 .36 .17 -.21
-.05 -.07 .25
1.03
42 GUINEA .26 .17 .04
.26 -.01 -.19 -.23 -.11 -.07 -.11
.13 .22 -.13
.46 -.12 -.09 .08 -.09 .07 .24
.16 .26 .31
.13 .00 .02 .18 .16 .04 .06

.19 .11 .24

1.05

43 HAITI .30 .24 .24

.23 -.12 .16 .16 -.16 -.22 -.05

-.16 .11 -.22

.34 .04 .27 .04 -.14 -.13 -.03

.15 -.26 -.13

.09 -.18 -.08 .11 -.16 -.27 .07

.29 .28 .05

1.15

44 HONDURAS -.18 -.21 .10

-.04 .02 -.12 -.01 -.21 -.31 -.19

-.11 -.16 -.18

-.28 .15 .33 -.13 -.02 -.17 .11

-.27 .14 -.15

.06 -.25 -.10 -.06 .19 .08 -.27

.05 -.30 .17

1.05

45 HUNGARY -.24 -.29 .10

.04 -.08 -.03 -.24 .17 -.32 -.04

-.16 .13 -.21

-.34 -.39 .24 -.02 .16 -.34 -.06

.32 -.29 .28

.08 .10 .22 .06 .35 -.25 .24

.12 .23 .45

1.75

46 ICELAND .00 .00 .00

.00 .00 .00 .00 .00 .00 .00

.00 .00 .00

.00 .00 .00 .00 .00 .00 .00

.00 .00 .00

.00 .00 .00 .00 .00 .00 .00

.00 .00 .00

.00

47 INDIA -.31 .15 -.17

.13 -.01 .32 -.03 .18 -.16 -.06

-.17 -.43 -.12

.02 .06 .07 .18 .10 .08 -.01

-.34 .34 -.02

-.14 -.05 -.05 .25 -.01 -.38 .08

.16 .24 -.22

1.22

48 INDONESIA .11 .17 .44

.06 -.04 .12 -.28 .28 -.19 -.08

-.04 -.19 -.09

.16 -.26 .06 -.09 .13 .01 .41

-.35 -.12 -.01

.08 -.03 -.06 .09 -.18 .23 .05

-.12 -.21 -.03

1.09

49	IRAN			-.11	.19	.24	
.23	-.18	.19	-.29	-.09	.08	-.17	
				.10	-.15	-.24	
-.30	-.12	.16	-.07	-.17	-.29	.34	
				.36	.21	.17	
-.13	-.06	-.37	.16	.08	-.16	-.28	
				.01	-.35	-.04	
1.43							
50	IRAQ			.12	-.11	-.11	
-.16	-.23	.23	-.46	-.04	-.04	-.12	
				-.02	.00	-.35	
-.16	.28	.14	-.25	-.42	-.20	.15	
				.30	.13	-.16	
-.13	-.01	-.14	.03	.32	.14	-.16	
				.13	-.42	.17	
1.49							
51	IRELAND			.06	.02	-.34	
-.08	-.12	-.07	-.01	-.02	-.22	-.11	
				-.12	.38	.11	
.28	-.18	-.16	-.40	-.24	.15	.14	
				.19	-.23	-.06	
-.02	-.27	-.16	.25	-.20	-.07	.11	
				-.12	.34	.17	
1.24							
52	ISRAEL			.05	-.13	.02	
-.28	.22	.05	-.45	-.02	-.07	.04	
				-.16	.37	.00	
.36	-.24	-.17	-.23	-.37	-.08	-.27	
				-.27	-.02	-.08	
-.12	.01	.09	-.11	.30	.00	-.18	
				.32	-.41	.22	
1.56							
53	ITALY			-.53	-.09	-.26	
.31	.18	-.19	-.23	-.19	-.31	-.03	
				-.17	-.33	.03	
.23	.02	-.24	.04	-.13	.04	-.09	
				-.21	.04	.14	
-.04	-.41	-.14	-.27	.05	-.02	-.25	
				.14	.19	.00	
1.43							
54	IVORY COAST			.27	.24	-.04	
.18	-.21	.06	-.07	.05	.02	-.38	
				-.21	.05	-.25	
.20	-.35	-.02	.03	-.18	.04	.19	
				.23	.09	.09	
-.12	-.06	-.14	.36	.22	-.03	.08	
				-.14	.08	-.03	
1.03							
55	JAMAICA			.00	.00	.00	
.00	.00	.00	.00	.00	.00	.00	

.00 .00 .00 .00 .00 .00 .00
.00 .00 .00 .00 .00 .00 .00
.00 .00 .00 .00 .00 .00 .00
.00

56 JAPAN
-.12 .10 -.26 .42 -.42 -.01 -.15
-.06 .11 -.32 -.02 -.17 -.18 -.02
.32 -.12 -.14 .02 -.16 -.44 -.04
1.51 -.20 .23 -.17
-.01 -.23 .15
.30 .11 .04
.39 .21 -.11

57 JORDAN
-.26 -.02 .23 -.47 .45 .28 .23
.00 -.22 .15 .07 -.19 .07 -.12
-.52 -.10 -.19 .31 -.27 .21 -.20
1.99 -.41 -.13 .09
-.25 -.02 -.03
.29 -.05 .18
.11 -.46 -.10

58 NORTH KOREA
-.21 -.05 -.40 -.42 .02 .05 -.13
-.14 .14 .12 .19 .00 .00 -.10
-.02 -.30 -.17 -.35 .07 -.28 -.23
1.37 -.11 -.31 .16
.15 -.27 -.22
.03 -.31 -.01
.13 .28 -.13

59 SOUTH KOREA
-.16 .17 .10 -.32 .11 .22 .17
.14 -.14 .23 .02 .18 -.07 -.05
.13 .19 .05 .23 .17 -.28 -.10
1.13 -.14 -.05 .08
-.23 -.22 .20
.32 -.29 .22
-.03 .26 -.20

60 LAOS
.10 -.09 .15 -.33 .26 .11 -.01
.24 -.04 -.20 .11 .10 .03 .29
.06 .26 -.09 .13 -.19 .57 -.16
1.09 -.06 .11 .12
.03 .24 -.09
-.03 -.14 -.07
.15 .11 -.13

61 LEBANON
-.33 .15 -.04 .22 .25 -.17 .14
.20 -.05 .03 .33 -.31 -.19 -.13
.23 .06 -.03
-.33 -.10 -.11

-.18 -.08 -.55
-.13 -.02 -.34 .01 .38 .12 -.21
-.15 -.02 .46
1.51
62 LIBERIA .12 .04 .03
.04 .28 -.41 .37 -.02 -.08 .00
-.24 .23 -.03
.19 .06 -.19 .02 -.03 -.05 -.04
.42 -.07 .02
.15 -.05 -.06 .09 -.01 -.10 .08
-.03 .13 .12
.87
63 LIBYA .51 -.15 .26
.15 -.23 .07 -.08 .25 .17 .20
-.21 .21 .01
-.38 .23 -.05 -.11 -.33 -.36 .19
-.13 .08 .28
-.32 -.16 -.13 .13 -.11 .11 -.26
-.07 .56 -.20
1.86
64 LUXEMBOURG .00 .00 .00
.00 .00 .00 .00 .00 .00 .00
.00 .00 .00
.00 .00 .00 .00 .00 .00 .00
.00 .00 .00
.00 .00 .00 .00 .00 .00 .00
.00 .00 .00
.00
65 MALAGASY REP .24 .42 -.12
.01 -.26 .06 .31 .11 .09 .35
-.19 -.09 -.20
.09 .29 .25 .07 .12 .06 -.22
.41 -.06 -.26
-.06 -.40 .15 .03 -.37 .39 .17
-.15 .37 .20
1.81
66 MALI .00 .00 .00
.00 .00 .00 .00 .00 .00 .00
.00 .00 .00
.00 .00 .00 .00 .00 .00 .00
.00 .00 .00
.00 .00 .00 .00 .00 .00 .00
.00 .00 .00
.00
67 MAURITANIA .24 .37 .38
.27 -.21 -.15 .29 .08 -.24 .04
.20 .00 -.12
-.07 -.04 .04 .14 .06 -.08 .08
.34 -.03 -.01
-.09 -.22 .13 .11 .01 .10 -.04

-.08 .08 -.29
1.04
68 MEXICO
-.20 -.03 .13 .43 -.24 .05 .07
-.25 .10 -.26
-.32 -.20 -.22
-.03 -.27 .18 .25 .18 .22 .15
.09 .18 -.04
-.41 -.13 -.27 -.14 -.04 -.03 .17
-.02 .31 -.15
1.38
69 MONGOLIA
.23 -.05 -.07 -.23 .32 -.09 -.07
-.11 -.15 -.02
-.08 .08 -.12
-.09 .09 .14 -.14 -.21 .20 -.11
.08 .06 -.16
.08 -.16 -.27 .08 -.08 -.08 -.22
-.03 .38 .04
.80
70 MOROCCO
.24 -.08 .26 -.05 .03 .07 .03
.32 -.04 -.25
-.17 .00 -.31
.45 -.02 -.10 .02 -.26 -.24 -.06
-.14 -.07 -.04
-.07 -.08 -.14 .21 .06 .03 .17
-.03 .03 -.28
.99
71 NEPAL
-.11 .34 .08 -.01 .24 -.20 -.06
.01 -.19 -.14
.11 .14 -.35
.20 -.18 .02 .06 .05 -.15 -.15
.21 -.46 -.20
-.27 -.11 .12 .11 .31 .16 .16
.12 .02 -.05
1.14
72 NETHERLANDS
-.07 .04 -.40 -.09 -.43 .11 -.14
-.15 -.22 -.19
-.14 .19 -.03
.03 .04 -.12 .01 -.06 .15 .10
.22 -.60 -.08
.13 .17 .05 -.29 .17 .08 -.14
-.21 .08 -.12
1.27
73 NEW ZEALAND
-.06 .25 -.26 .09 .21 -.24 -.20
.38 -.06 .03
.21 -.01 -.02
-.04 -.06 -.10 .37 -.23 .17 .08
-.02 -.08 -.03
-.05 .07 .07 .16 -.08 .21 -.11
.05 .12 .10
.85

74 NICARAGUA
-.28 .10 .12 -.07 -.15 -.15 -.23
-.17 .21 .27 .13 -.16 -.20 -.09
.06 -.03 -.01 .30 .21 -.15 -.16
.88 .21 -.01 -.07
.09 .15 .17
-.05 .05 -.23
.07 -.26 -.09

75 NIGER
.24 -.27 -.24 .14 .29 .25 .27
.29 -.19 -.13 .03 .23 .06 -.13
-.14 .06 .03 .14 .05 .21 .06
1.24 -.01 .01 .14
.37 .16 .33
-.04 -.26 -.10
.17 .32 -.07

76 NIGERIA
.14 -.09 .24 .17 .02 .30 -.13
.03 -.18 -.05 .04 .29 -.13 -.07
-.31 .19 -.27 .23 .02 -.12 -.27
1.03 .05 -.27 -.05
-.06 .10 -.16
-.06 -.25 .26
-.04 .23 -.11

77 NORWAY
-.02 -.07 -.11 -.25 -.20 -.27 .08
-.09 .02 -.33 -.08 .03 -.40 .02
.20 -.09 .03 -.21 -.10 .43 -.04
1.08 .08 .07 -.07
.05 -.43 -.20
-.13 .10 -.12
-.11 .08 .06

78 PAKISTAN
.13 .01 .28 .07 -.09 -.04 -.01
.53 .16 .17 .19 -.15 -.13 -.22
-.05 .03 .14 .14 -.23 -.60 -.18
1.37 -.11 -.17 -.06
-.58 .15 -.03
-.12 -.32 .07
-.09 -.15 -.34

79 PANAMA
-.17 -.15 -.02 .21 .33 -.06 -.03
-.08 -.14 .05 .15 -.08 .11 -.23
-.20 -.31 .26 -.03 -.13 .10 -.17
.98 -.26 .02 .21
-.07 -.27 .26
.03 -.19 -.14
.13 .23 .05

80 PARAGUAY
.00 .00 .00 .00 .00 .00 .00
.00 .00 .00

.00 .00 .00 .00 .00 .00 .00
.00 .00 .00 .00 .00 .00 .00
.00 .00 .00
.00
81 PERU .11 .15 -.15
-.27 -.16 .15 .18 -.34 .02 -.20
-.18 -.04 -.16
.06 -.11 -.16 .19 -.11 -.10 .11
.11 .17 .27
-.25 .22 -.19 -.06 .22 .09 -.02
-.36 .30 -.27
1.15
82 PHILIPPINES .00 .23 -.12
-.11 -.13 .24 .45 .12 -.04 -.29
-.02 -.41 .11
.29 -.25 -.29 .03 -.15 .13 .36
.02 -.33 .06
.14 .07 .17 .04 -.28 .09 -.27
-.07 .45 .16
1.60
83 POLAND -.49 -.19 .20
-.22 -.17 -.09 -.31 .24 -.32 .02
.15 -.33 -.20
-.42 -.35 .06 .02 .29 -.23 .06
.14 .09 .06
.05 -.05 .26 .03 -.04 -.12 -.08
.20 .27 .53
1.79
84 PORTUGAL -.01 -.12 .16
-.09 -.05 -.04 -.20 -.26 -.33 -.09
.09 .14 -.22
.42 -.15 .03 .00 .34 .14 .10
.00 -.47 -.05
-.38 -.11 .13 .15 .02 -.08 .36
.03 -.30 -.06
1.35
85 ROMANIA -.41 -.18 .08
-.25 .01 .13 -.39 -.10 -.38 -.19
-.34 -.37 -.14
-.45 -.40 .07 .05 .51 -.32 .00
.31 -.07 .52
.21 -.03 .21 .28 .22 -.32 -.11
.02 .40 .59
2.84
86 RWANDA -.04 -.21 -.10
.00 .04 .15 -.19 -.24 .11 -.02
-.21 -.06 -.23
-.17 -.09 .04 -.26 -.21 .21 .34

.12 -.02 .22
.00 -.32 .13 .23 -.45 -.09 .26
-.01 -.16 -.04
1.14
87 SAUDI ARABIA -.04 -.05 -.06
.13 -.18 -.07 -.19 -.05 .00 .10
.17 .19 -.29
-.19 .11 -.22 .26 .28 -.16 .15
.12 .06 .13
.12 -.11 .01 -.03 -.15 .07 -.15
.32 -.13 -.28
.86
88 SENEGAL .26 .04 .25
-.15 -.24 -.25 -.11 .18 -.01 .10
.06 .24 -.18
.20 -.17 -.04 .14 .09 -.27 -.06
-.36 .28 .26
-.04 -.06 -.04 .17 .02 .11 -.07
-.31 .23 -.23
1.13
89 SIERRA LEONE .21 .23 .23
-.16 -.19 .24 -.01 .21 -.02 .13
-.15 .18 -.23
.03 -.20 .32 -.10 .02 -.18 -.09
.03 .10 .37
-.35 .23 -.23 -.04 -.05 -.09 .19
.01 .34 .03
1.17
90 SOMALIA .19 .02 -.08
-.07 -.22 -.23 -.06 .17 .01 .06
-.07 .27 -.06
.23 -.12 -.32 -.15 -.05 .07 -.02
-.07 .16 .38
-.03 .09 .00 .09 -.11 -.22 .01
.27 .00 -.16
.81
91 SOUTH AFRICA -.20 -.02 -.20
.03 -.19 .24 .20 .35 .17 .12
.09 .01 -.14
-.24 .04 -.02 -.08 -.18 -.10 -.10
-.16 .08 -.25
-.18 .27 -.17 .19 -.27 -.20 .28
-.28 .49 .00
1.30
92 SPAIN -.26 -.14 .25
.41 -.22 -.02 -.02 -.12 -.28 -.24
-.56 -.19 -.16
.14 -.09 -.22 .16 -.12 .19 .05
-.28 -.01 .36
-.26 .15 -.16 .04 .21 -.23 .38

.24 -.06 -.13

1.51
93 SUDAN
.24 .23 .03
-.02 -.06 -.04 .16 .17 .15 .22
.20 .12 -.10
.14 -.29 .17 -.36 .23 .06 -.18
-.14 .21 .16
-.26 .07 .00 .19 .19 -.24 .13
.28 -.27 -.11

1.13
94 SWEDEN
-.23 -.22 -.19
.34 -.23 -.36 -.27 -.15 -.12 -.07
-.10 .34 -.11
.12 .04 -.17 .04 .07 -.08 -.06
.16 -.27 -.27
.21 -.17 .19 -.11 .06 .15 -.11
.06 -.14 -.02

1.10
95 SWITZERLAND
-.33 -.40 -.21
.35 -.14 -.26 -.43 -.22 -.11 -.25
.22 .39 -.05
.47 .13 -.09 -.22 .26 -.33 .07
.25 -.32 -.24
.04 -.09 .09 .12 .04 -.14 .35
.11 -.09 .05

1.93
96 SYRIA
.33 .08 -.03
-.26 -.06 .21 -.44 -.17 .01 -.07
-.04 .06 -.39
.29 -.23 -.08 -.09 -.44 -.27 .02
-.28 -.02 -.30
-.33 -.23 .38 .30 .27 .32 -.06
.34 -.40 .26

2.12
97 THAILAND
.07 .06 .13
.16 -.28 -.14 .17 .02 -.10 -.23
-.24 -.32 -.11
.13 .04 -.18 .04 .06 -.12 .28
.45 -.17 .11
-.10 .15 .09 .02 -.08 -.12 -.14
.15 .06 .21

.96
98 TOGO
.15 -.29 .04
-.03 -.20 -.59 -.25 -.29 -.03 .03
-.13 .13 -.10
-.01 .07 -.02 .12 -.17 .08 .11
-.17 -.13 .02
.02 -.18 .31 .14 -.11 .02 -.05
-.03 -.12 .01

.98

```
 99  TRINIDAD                                    .00       .00       .00
.00        .00       .00       .00       .00       .00       .00
                                                .00       .00       .00
.00        .00       .00       .00       .00       .00       .00
                                                .00       .00       .00
.00        .00       .00       .00       .00       .00       .00
                                                .00       .00       .00
.00
100  TUNISIA                                     .38       .29      -.13
-.25       -.30       .07      -.02       .19      -.19       .11
                                               -.28       .37      -.06
.45        -.18       .12       .31      -.37      -.26      -.33
                                               -.01       .13       .03
.09        -.03       .20      -.09      -.07       .23       .08
                                               -.06       .29      -.22
1.64
101  TURKEY                                     -.24       .37      -.31
.03        -.04       .00      -.40      -.30       .20      -.10
                                                .07      -.25       .00
.21        -.29      -.06       .18       .48       .00      -.22
                                               -.26       .24      -.13
-.40        .21       .05      -.10       .02      -.37       .02
                                               -.03      -.33       .31
1.81
102  UGANDA                                     .21      -.23      -.07
-.17       -.22       .34      -.15      -.21       .01      -.26
                                               -.33       .23      -.18
.12        -.06       .29       .28      -.18       .05      -.25
                                               -.02      -.15       .16
-.08       -.04       .19       .09       .28       .14      -.07
                                                .00       .00      -.01
1.10
103  U.S.S.R                                   -.55       .01       .11
-.13       -.21      -.01      -.41      -.03      -.13       .39
                                                .24      -.43      -.04
-.34       -.11      -.28      -.19       .15      -.15       .03
                                                .03       .33       .36
.13         .05       .24       .11       .07       .17       .05
                                                .09      -.42       .25
1.86
104  U.A.R.                                    -.14       .31       .15
.25        -.15      -.18      -.11       .02       .26      -.03
                                               -.23      -.13      -.21
.16        -.16       .11       .13      -.36      -.25      -.14
                                               -.20      -.14      -.15
-.25        .09       .30      -.10       .12      -.12      -.20
                                                .24      -.49       .31
1.46
105  UNITED KINGDOM                            -.62      -.18      -.18
.19        -.06      -.04      -.17      -.17      -.19      -.02
```

				-.02	-.43	.02
-.36	.01	-.30	-.07	-.06	.10	-.11
				-.25	-.06	-.25
.32	.02	.00	-.01	.20	-.04	-.15
				-.24	-.59	-.02
1.72						
106	UNITED STATES			-.64	.05	-.03
-.27	-.09	.32	-.46	-.17	-.09	.45
				-.01	-.63	.22
-.18	.04	-.01	-.16	.07	.01	-.17
				-.38	.30	.09
.33	.18	-.18	.07	.03	.17	.10
				.05	-.33	.11
2.17						
107	UPPER VOLTA			.00	.00	.00
.00	.00	.00	.00	.00	.00	.00
				.00	.00	.00
.00	.00	.00	.00	.00	.00	.00
				.00	.00	.00
.00	.00	.00	.00	.00	.00	.00
				.00	.00	.00
.00						
108	URUGUAY			.18	-.12	.12
-.14	-.01	.01	-.22	-.33	.01	-.21
				.09	.06	-.11
.03	-.13	-.01	.02	-.06	.06	.30
				-.09	.06	-.29
-.15	-.29	.12	.06	-.07	-.04	-.06
				.19	-.11	.18
.73						
109	VENEZUELA			-.30	-.23	-.07
-.36	.01	.25	.25	-.29	.22	-.13
				.23	.22	-.50
-.55	-.12	-.39	.10	-.15	-.28	-.05
				-.18	.11	.38
-.28	.15	.05	.25	.19	.30	-.42
				-.06	.17	.05
2.18						
110	NORTH VIETNAM			.47	.27	.05
.24	-.22	-.31	-.38	.23	.07	-.03
				-.08	-.26	-.19
.17	.03	.16	.15	.10	-.30	-.06
				.31	-.37	.09
.28	-.19	-.11	.16	-.23	.12	-.15
				-.19	.05	-.09
1.52						
111	SOUTH VIETNAM			.31	.20	.21
.12	-.15	.17	-.32	.09	.01	-.02
				-.14	-.20	-.16
.27	-.23	.28	.09	-.01	-.36	.21

-.22 -.05 .27
.05 .18 -.05 .16 -.18 -.15 .05
.03 -.09 -.03
1.09
112 YEMEN .45 .24 .05
.14 -.11 .06 .32 -.17 -.21 -.30
-.36 .24 -.12
.44 .11 .12 .21 .25 -.27 .06
.07 -.33 .36
-.15 .32 -.05 .19 .28 .04 .30
.24 .37 -.05
1.94
113 YUGOSLAVIA -.21 .05 -.04
-.09 -.14 -.26 -.33 .07 -.26 .02
-.24 -.23 -.21
-.06 -.13 .34 .07 .31 -.11 -.34
.28 .03 .30
-.16 .13 .09 -.09 .17 -.19 .07
-.08 -.09 .42
1.33
114 BOTSWANA .00 .00 .00
.00 .00 .00 .00 .00 .00 .00
.00 .00 .00
.00 .00 .00 .00 .00 .00 .00
.00 .00 .00
.00 .00 .00 .00 .00 .00 .00
.00 .00 .00
.00
115 GAMBIA .39 .35 -.24
.04 -.13 -.18 -.24 .20 -.24 -.05
-.25 -.18 .07
.28 .02 -.16 -.05 .11 -.17 -.02
.20 -.15 .11
-.25 .08 .02 .01 -.10 .37 -.27
-.24 .46 .17
1.45
116 KUWAIT .06 -.10 .08
-.07 -.25 -.27 .36 .16 -.13 -.53
-.30 .30 -.28
-.15 -.26 -.23 .29 -.30 -.08 -.09
.03 -.12 .13
-.01 .11 -.06 -.12 .23 .24 -.18
-.22 .01 -.16
1.48
117 LESOTHO .00 .00 .00
.00 .00 .00 .00 .00 .00 .00
.00 .00 .00
.00 .00 .00 .00 .00 .00 .00
.00 .00 .00
.00 .00 .00 .00 .00 .00 .00

.00 .00 .00
.00
118 MALAWI
.36 .23 -.09
.26 -.20 .14 -.05 .12 -.14 .01
.22 .14 -.36
.27 -.11 .11 .14 .06 -.22 -.13
.12 -.31 .24
.36 .18 .00 .16 .07 .14 -.09
-.05 .27 .16
1.23
119 MALTA
.32 -.24 .19
-.26 -.24 .12 -.33 .17 -.24 -.11
-.20 .23 -.30
-.13 -.06 -.07 -.06 .20 .35 -.05
.00 -.12 .11
.13 .30 .12 -.01 -.01 .23 -.17
-.24 -.22 -.27
1.33
120 TANZANIA
.38 .04 .12
-.03 -.10 .12 .13 .16 -.27 -.04
-.06 .31 -.18
.29 -.12 .24 .07 -.13 .02 -.19
.23 .26 .08
-.20 -.03 .13 .17 .09 .12 .18
-.07 .02 .32
1.03
121 ZAMBIA
.39 .15 .41
-.11 -.05 .27 .01 .29 .27 .03
-.13 .46 -.28
.30 -.15 .00 -.10 .04 -.52 -.03
-.14 .22 -.10
.03 -.17 -.30 .09 -.20 -.19 -.16
-.33 -.03 .15
1.56
122 KENYA
.15 -.16 -.25
.14 -.18 .23 -.14 -.22 .14 -.21
-.01 .08 -.20
-.12 -.11 .26 .13 -.14 .05 -.30
-.21 .08 .03
.02 -.15 .10 .15 .10 -.07 -.13
-.06 -.09 .15
.79
123 W. SAMOA
.00 .00 .00
.00 .00 .00 .00 .00 .00 .00
.00 .00 .00
.00 .00 .00 .00 .00 .00 .00
.00 .00 .00
.00 .00 .00 .00 .00 .00 .00
.00 .00 .00
.00

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124  SINGAPORE                                    .54       .16      -.08
-.09       -.15       .24       -.36              .06       .02       -.01
                                                  .07       .12      -.14
-.10       -.07       .05       -.06             -.09       .04        .17
                                                 -.26      -.47       .10
 .29        .24      -.32        .16             -.08       .52      -.22
                                                  .00       .19       .00
1.23
125  GUYANA                                      -.13       .16      -.16
-.31       -.17       .30        .11              .42       .16      -.21
                                                  .05       .05       .13
 .59       -.27      -.20        .07              .20      -.42      -.12
                                                 -.09      -.38       .13
-.13       -.29       .02       -.15             -.08      -.04      -.15
                                                 -.07       .17      -.34
1.73
126  MALAYSIA                                     .18       .08       .11
 .11       -.08      -.36       -.26              .10      -.17      -.22
                                                 -.22       .41      -.23
 .35       -.09       .05       -.46              .07       .11       .10
                                                 -.28      -.32       .05
 .04       -.06      -.16       -.03             -.18       .09      -.06
                                                 -.23      -.08      -.04
1.31
127  MALDIVE ISLANDS                             .32      -.14       .07
 .11       -.14      -.14       -.05              .12      -.19       .00
                                                  .01      -.18      -.12
 .24        .19      -.32        .03             -.03       .26      -.20
                                                 -.15      -.40       .05
 .13        .05       .04       -.38             -.22       .03      -.09
                                                 -.26       .36      -.06
1.19
128  BARBADOS                                    .11       .51      -.14
-.31       -.16      -.16       -.41              .04       .14      -.17
                                                  .04      -.13      -.27
 .01       -.24       .11        .04             -.26       .12      -.25
                                                  .08      -.09       .22
 .11        .14      -.20        .01             -.02      -.18       .23
                                                  .15       .43      -.03
1.40


COLUMN SUM OF SQUARES                            9.83      5.09      3.60
4.01       2.57      5.35       7.12              4.65      3.76      3.92
                                                 3.56      7.33      4.60
7.74       3.48      4.09       2.96              5.03      4.49      3.54
                                                 5.32      6.53      4.76
4.74       3.46      3.29       3.38              4.05      3.47      3.47
                                                 3.65      7.46      4.71
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